UNIVERSITY OF TORONTO
3 1761 00085120 4

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/medicalsideofben00peppuoft

THE MEDICAL SIDE

OF

BENJAMIN FRANKLIN

Dessiné d'après le portrait peint par Duplessis à Paris en 1778, et Gravé par Ambroise Tardieu.
BENJAMIN FRANKLIN
(Physicien et Philosophe,)
Membre de la société royale de Londres.
Né à Boston (Etats unis d'Amerique) le 17 Jenvier 1706
Mort à Philadelphie le 17 Avril 1790

FIG. 1.—Benjamin Franklin. Physicien et Philosophe. From an engraving by Ambroise Tardieu, after the protrait by Duplessis. In the author's collection.

THE MEDICAL SIDE

OF

BENJAMIN FRANKLIN

BY

WILLIAM PEPPER, M.D.

PHILADELPHIA
WILLIAM J. CAMPBELL
1911

LIBRARY
JUN 29 1971
UNIVERSITY OF TORONTO

E
302
.6
F8P4

TO THE MEMORY

OF MY

GREAT-GREAT-GREAT-GRANDFATHER

Special Edition Limited to 250 Copies, of which this is No. 210

PREFACE

In 1905, when the first volume of *The Writings of Benjamin Franklin, Collected and Edited, with a Life and Introduction*, by Albert Henry Smyth, appeared, I decided to read seriatim each volume as it arrived from the publishers. I feel sure that I would never have had the moral courage to have undertaken such a task, albeit a pleasant one, had the ten volumes appeared simultaneously. Apropos of this, I remember as a child my father buying for me a complete set of Dickens' works, and wisely secreting them and giving me on successive Christmases two or three volumes, which naturally I read with avidity, and thereby formed a great fondness for these wonderful novels. Let me recommend this plan to parents—to publishers it would hardly appeal. As I read through the ten volumes of Franklin's writings I marked all the references or allusions to medical matters, and their number amazed me. Some of these I read several years ago at a meeting of the Section on Medical History of the College of Physicians of Philadelphia. Later, having collected a number of engravings representing many of Franklin's medical friends, I delivered, on December 7, 1909, an illustrated address upon the "Medical Side of Benjamin Franklin," before the Baltimore City Medical Society. This address was published in the University of Pennsylvania Medical Bulletin, and finally I have now republished it, with some slight changes, in its present form. A comprehensive index has been included in order to offset the rather disconnected narrative which is arranged chronologically and not under subjects.

W. P.

The Medical Side of Benjamin Franklin

CHAPTER I

Benjamin Franklin lived in an age when men of education and genius in varying paths of life did not consider it strange or peculiar to think, discuss, or write about medical matters. These men did not feel that they were intruding on any ground sacred to the physician in so doing. Thus we find Mathew Carey, the publisher, who worked so heroically on the committee of safety during the yellow fever epidemic of 1793 in Philadelphia, writing an *Account of the Malignant Fever*, that ran through four editions within two months; Noah Webster, the lexicographer, compiling a *History of Epidemic and Pestilential Diseases;* Thomas Jefferson receiving from Edward Jenner vaccine virus, of which he made good use. Franklin, however, just as he surpassed in some other lines of thought these men, outdid them in his knowledge of medical affairs.

"The study of medicine was one of Franklin's chief interests, and it is one of the least known," said Professor Smyth in the introduction to his splendid edition of the *Life and Writings of Benjamin Franklin;* and so, although perhaps few new facts can be added, the compilation of the following abstracts from Franklin's writings, together with a few statements taken chiefly from Smyth, from Paul Leicester Ford's *The Many-sided Franklin,* and from Sydney George Fisher's *The True Benjamin Franklin,* will impress upon us how much of a physician Benjamin Franklin really was. The recently published calendar of the *Papers of Benjamin Franklin,* in the library of the American Philosophical Society, so ably edited by Dr. I. Minis Hays, has also been a great help in discovering references to medical matters in the many letters to Franklin in that large collection. As Atkinson says in his *Medical Bibliography:* "We must all plagiarize from each other, or little will be made out, in so intricate an art as medicine. When a writer affects to despise the works of others, and ventures to produce

his own as valuable and original, we may be assured that, in this instance at least, he is an original fool at any rate."

Although Franklin was not a graduate of any medical school, still he was elected a member of several medical societies; and it must not be forgotten that in those days many of the physicians had no degrees. Although he did not practise medicine as a profession and receive payment for his medical advice, still he nevertheless did treat a number of people for various ills. Never calling himself physician, he was, however, so considered by some, as the engravings here reproduced show. He never actually studied medicine, but yet he purchased and borrowed many medical works, read them, commented on them, and discussed with his friends various diseases and their method of treatment. He was a keen student of such diseases as came under his observation. He was an early and great hygienist. All of which, though not entitling him to write Doctor of Medicine after his name, would in those days of common lack of medical education and frequent disregard of collegiate instruction have permitted him, had he not had other work to perform, to have called himself physician and to have actually practised medicine.

The University of St. Andrews conferred upon Benjamin Franklin, when he was fifty-three years of age, the honorary degree, by virtue of which he was ever after known as Dr. Franklin. In the records of the Senatus Academicus of that University, occurs this entry:

12 Feb., 1759.

Conferred the Degree of Doctor in Laws on Mr. Benjamin Franklin, famous for his writings on Electricity, and appoint his diploma to be given him gratis, the Clerk and Archbeadle's dues to be paid by the Library Quaestor.

He had in July, 1753, received the honorary degree of Master of Arts from Harvard College, and the same degree in September of that year from Yale College.

Among the many medical subjects that Dr. Franklin discussed with his friends, might be mentioned "Diet and its Effect on Health and Disease." Franklin wrote in a letter that "In general, mankind, since the improvement of cooking, eat about twice as much as nature requires. Suppers are not bad, if we have not dined, but restless nights naturally follow hearty suppers after full dinners. Indeed, as there is a difference

in constitutions, some rest well after these meals; it costs them only a frightful dream and an apoplexy after which they sleep till doomsday. Nothing is more common in the newspapers than instances of people, who after eating a hearty supper, are found dead abed in the morning." He discussed exercise as a means of preserving health and the best forms to use, the influence of swimming, cold baths and fresh air. The taking or catching of colds was a very favorite topic of Franklin's and his nearest approach to a real medical article is on this subject. He held very sensible views, considering his day, and gave much sensible advice, which the world has been slow to accept. The modern treatment of tuberculosis is based largely on the open air mode of life Franklin so persistently advocated. When he had unacceptable advice to give of any kind, he made people swallow down the bitter pill by giving it a sugar coating of humor or jest. So we find him in his bagatelle "The Art of Procuring Pleasant Dreams," telling us, "It is recorded of Methusalem, who, being the longest liver, may be supposed to have best preserved his health, that he slept always in the open air; for, when he had lived five hundred years, an angel said to him, "Arise, Methusalem, and build thee an house, for thou shalt live yet five hundred years longer." But Methusalem answered and said, "If I am to live but five hundred years longer, it is not worth while to build me a house; I will sleep in the air as I have been used to do." He repeatedly stated that colds were caught by being in close, unventilated rooms in which were other people who possibly were already affected. He thought that damp clothes might cause colds, but that clothes wet with sea water would not, because, as he says, no clothes could be wet as water itself, and one did not catch cold while bathing and swimming. He recognized the epidemicity and contagiousness of colds. He also remarked that bathing would quench the thirst and stop diarrhea, and that bathing or sponging with water or spirits would reduce the temperature by evaporation in fevers. He wrote a very capable letter on the heat of the blood and the causes thereof, and also upon the motion of the blood, and had in his library a glass machine that demonstrated this motion of the blood through the arteries, veins and capillaries. He discussed, learnedly, the absorbent vessels and perspiratory ducts of the skin and carried on experiments to prove his theories. Sleep, deafness, and nyctalopia all engaged Franklin's attention. He invented bifocal lenses for spectacles and a flexible

catheter. He was much interested in medical education and had decided views on the subject. He helped many young medical students in their desire to study abroad, among them Rush, Morgan, Shippen, Kuhn, and Griffitts. Although Thomas Bond originated the idea of the Pennsylvania Hospital, Franklin created it and was its President.

His letters on lead poisoning are wonderful, and would have been a credit to any physician of that age; his observations upon gout, and personal observations they were, are shrewd and exact. Smallpox and inoculation, cancer, yellow fever, fever and ague, sea-sickness, all claimed his attention. In many of Franklin's letters we note his interest in various drugs and in various methods of cure. He showed a healthy skepticism of all empirical remedies, when one considers the time in which he lived. Much could be written of his treatment of nervous diseases by electricity. Many patients consulted him; many doctors wrote to him for advice; even Sir John Pringle begs him to come and treat the daughter of the Duke of Ancaster. Franklin was not carried away by his temporary successes with this method of treatment, Franklinism, as it has been called, but gives a very reserved opinion upon its value. There are a number of letters in the American Philosophical Society's collection asking for details of a cure for dropsy, that Franklin was supposed to have discovered, but of which he disclaimed any knowledge. He was interested in vital statistics and the mortality of different diseases. He wrote about the great death rate of foundlings and among children not nursed at the breast by their own mothers, and the growing habit among the French to neglect this duty. He discussed the doctrines of life and death. On several occasions he wrote about the possibility of infection remaining for long periods in dead bodies after burial, and the effect of electricity on animals killed by electricity. His ability and knowledge in everything pertaining to medicine led the King of France to appoint him a member of the commission which investigated Mesmer, and it was Franklin who wrote the report. He proved himself a comparative anatomist in a description which he wrote about some fossil elephant's teeth that he examined. Even Dr. Jan Ingenhousz, physician to Maria Theresa and Joseph II, before inoculating the young princes, sought Franklin's advice.

One cannot help being impressed by the fact that the majority of Franklin's friends seem to have been medical men, at least if we judge

FIG. 2.—Dr. Thomas Bond. From an old minature belonging to the author.

from the letters to and from Franklin. He corresponded, visited, and travelled with them, and they seem to have been his most congenial friends. Physicians dedicated their works to him, translated his writings into French, invited him to their meetings, made him a member of their societies, and received him always as one of their own body. It is interesting to speculate upon the kind of physician Franklin would have made, and I believe all will agree with me, after reading the following pages, in feeling that with his great common sense, his so pleasing personality, his wonderfully wide knowledge, his extraordinary tact, his way of always getting what he wanted, his ability to make friends, his insight into human character, his love of investigation, and in fact everything that goes to make up the truly big man in the medical profession, he would, had he devoted himself to medicine almost exclusively, now be considered, one of the greatest physicians of our country. Well indeed, even as it is, did he merit the title of Doctor of Medicine, and it is our loss that we can only claim him as a sort of adopted father of the profession.

I have thought it best for the sake of clearness to reprint first from Franklin's *Autobiography* and then in chronological order, abstracts from Franklin's writings. In the *Autobiography* but few references appear worthy of quotation. The following account, however, shows his interest in dietetic matters even when he was a lad. He was actuated not alone, however, by mere thoughts of health.

. . . When about sixteen years of age I happened to meet with a book, written by one Tryon, recommending a vegetable diet. I determined to go into it. My brother, being yet unmarried did not keep house, but boarded himself and his apprentices in another family. My refusing to eat flesh occasioned an inconveniency, and I was frequently chid for my singularity. I made myself acquainted with Tryon's manner of preparing some of his dishes, such as boiling potatoes or rice, making hasty pudding, and a few others, and then proposed to my brother, that if he would give me weekly, half the money he paid for my board, I would board myself. He instantly agreed to it, and I presently found that I could save half of what he paid me. This was an additional fund for buying books. But I had another advantage in it. My brother and the rest going from the printing-house to their

meals I remained there alone, and, despatching presently my light repast, which often was no more than a bisket or a slice of bread, a handful of raisins or a tart from the pastry-cook's, and a glass of water, had the rest of the time till their return for study, in which I made the greater progress, from that greater clearness of head and quicker apprehension, which usually attend temperance in eating and drinking. . . .

Franklin says in another place:

. . . I had brought over a few curiosities, among which the principal was a purse made of the asbestos, which purifies by fire. Sir Hans Sloane[1] heard of it, came to see me, and invited me to his house in Bloomsbury Square, where he showed me all his curiosities, and persuaded me to let him add that to the number, for which he paid me handsomely. . . .

In the British Museum there is, however, the following letter, which puts a slightly different aspect upon the sale of the purse:

(London) June 2, 1725.

To Sir Hans Sloane,

Sir:

Having lately been in the Nothern Parts of America I have brought from thence a Purse made of the Stone Asbestus, a Piece of Wood, the Pithy Part of which is of the same Nature, and call'd by the Inhabitants, Salamander Cotton. As you are noted to be a Lover of Curiosities, I have inform'd you of these; and if you have any Inclination to purchase them, or see 'em, let me know your Pleasure by a Line directed for me at the Golden Fan in Little Britain, and I will wait upon you with them.

I am, Sir

Your most humble Servant

Benjamin Franklin.

P. S. I expect to be out of Town in 2 or 3 Days, and therefore beg an Immediate Answer:—

[1] Sir Hans Sloane, 1660–1763. Born in Ireland. Studied and practised medicine in London. Travelled widely and made large collections of plants and other objects in natural history. Physician-General to the Army. President of the College of Physicians. President of the Royal Society, etc. On his death, his library of fifty thousand volumes and his various collections were purchased by the nation for £20,000, and formed the nucleus of the British Museum.

FIG. 3.—Sir Hans Sloane.

A short piece from his *Autobiography* gives his views succinctly on inoculation. His point of view might well be urged nowadays on many who fear vaccination.

. . . In 1736 I lost one of my sons, a fine boy of four years old, by the small-pox, taken in the common way. I long regretted bitterly, and still regret that I had not given it to him by inoculation. This I mention for the sake of parents who omit that operation, on the supposition that they should never forgive themselves if a child died under it; my example showing that the regret may be the same either way, and that, therefore, the safer should be chosen. . . .

There is a memorandum of Franklin's that states that Sally (his daughter) was inoculated April 18, 1746.

In the *Pennsylvania Gazette* of December 13, 1736, his own newspaper, Franklin printed the following notice:

Understanding 'tis a current Report, that my Son *Francis*, who died lately of the Small Pox, had it by Inoculation; and being desired to satisfy the Publick in that Particular; in as much as some People are, by that Report (join'd with others of the like kind, and perhaps equally groundless) deter'd from having that Operation perform'd on their children, I do hereby sincerely declare, that he was not inoculated, but receiv'd the Distemper in the common Way of Infection, and I suppose the Report could only arise from its being my known Opinion, that Inoculation was a safe and beneficial Practice; and from my having said among my Acquaintance, that I intended to have my child inoculated as soon as he should have recovered sufficient strength from a Flux with which he had been long afflicted.

B. Franklin.

Benjamin Franklin, it is often stated, was the founder of the Pennsylvania Hospital, but he gives in his *Autobiography* full credit to Dr. Thomas Bond for originating the plan. The story of the foundation of this our oldest hospital in this country is worth quotation if for no other reason than to prove that "political manœuvres" may serve beneficial ends at times.

. . . In 1751, Dr. Thomas Bond,[1] a particular friend of mine, conceived the idea of establishing a hospital in Philadelphia (a very beneficient design, which has been ascrib'd to me, but was originally his), for the reception and cure of poor sick persons, whether inhabitants of the province or strangers. He was zealous and active in endeavouring to procure subscriptions for it, but the proposal being a novelty in America, and at first not well understood, he met with but small success.

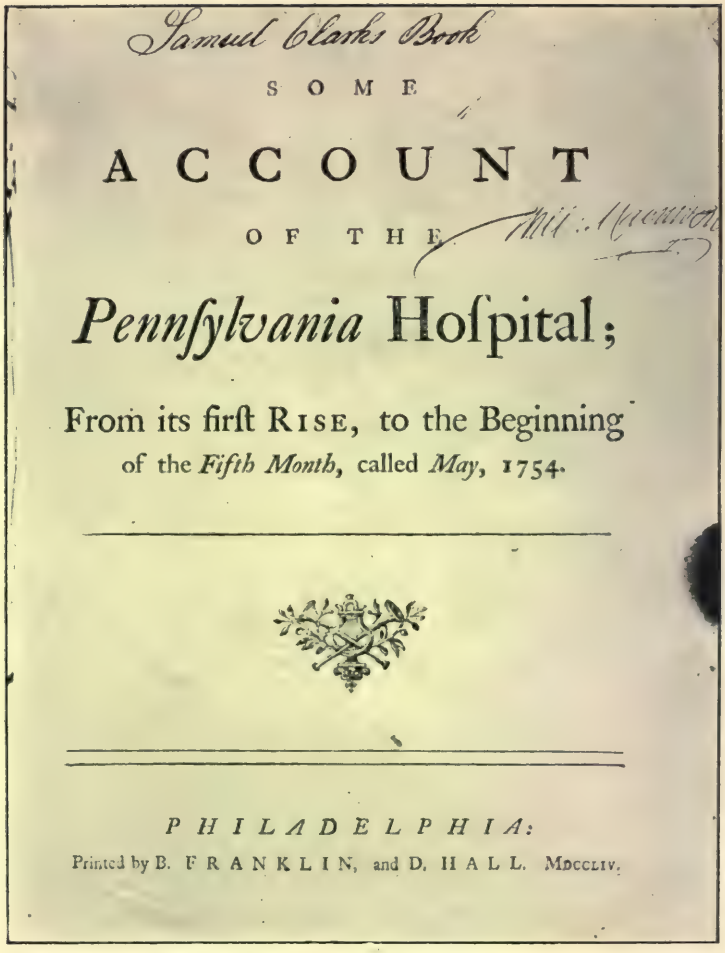
At length he came to me with the compliment that he found there was no such thing as carrying a public-spirited project through without my being concern'd in it.

"For," says he, "I am often ask'd by those to whom I purpose subscribing. Have you consulted Franklin upon this business? And what does he think of it? And when I tell that I have not (supposing it rather out of your line), they do not subscribe, but say they will consider of it." I enquired into the nature and probable utility of his scheme, and receiving from him a very satisfactory explanation, I not only subscrib'd to it myself, but engag'd heartily in the design of procuring subscriptions from others. Previously, however, to the solicitation, I endeavoured to prepare the minds of the people by writing on the subject in the newspapers, which was my usual custom in such cases, but which he had omitted.

The subscriptions afterwards were more free and generous; but, beginning to flag, I saw they would be insufficient without some assistance from the Assembly, and therefore propos'd to petition for it, which was done. The country members did not at first relish the project, they objected that it could only be serviceable to the city, and therefore the citizens alone should be at the expense of it; and they doubted whether the citizens themselves generally approv'd of it. My allegation on the contrary, that it met with such approbation as to leave no doubt of our being able to raise two thousand pounds by voluntary donations,

[1] Thomas Bond, 1712–1784. Born in Calvert Co., Md. Came to Philadelphia and began to practice medicine in 1734. Physician to the Pennsylvania Hospital from its foundation in 1751 until 1784. In 1766 in that Hospital, he gave his first course of clinical lectures, the first of their kind in this country. Founder of the American Philasophical Society. An original trustee of the University of Pennsylvania. During the Revolution, although over sixty, he served as one of the examining surgeons of the Colonial Medical Department.

FIG. 4.—The Pennsylvania Hospital. From a student's certificate of the year 1792. Engraved by R. Scot. In the possession of the author.


Samuel Clarke's Book

SOME

ACCOUNT

OF THE

Pennſylvania Hoſpital;

From its firſt RISE, to the Beginning of the *Fifth Month*, called *May*, 1754.

PHILADELPHIA:

Printed by B. FRANKLIN, and D. HALL. MDCCLIV.

FIG. 5.—Title-page of Franklin's Account of the Pennsylvania Hospital. From a copy in the author's library.

they considered as a most extravagant supposition, and utterly impossible.

On this I form'd my plan; and, asking leave to bring in a bill for incorporating the contributors according to the prayer of their petition, and granting them a blank sum of money, which leave was obtained chiefly on the consideration that the House could throw the bill out if they did not like it, I drew it so as to make the important clause a conditional one, viz., "And be it enacted by the authority aforesaid that when the said contributors shall have met and chosen their managers and treasurer, and shall have raised by their contributions a capital stock of . . . value (the yearly interest of which is to be applied to the accommodating of the sick poor in the said hospital, free of charge for diet, attendance, advice, and medicines), and shall make the same appear to the satisfaction of the speaker of the Assembly for the time being, that then it shall and may be lawful for the said speaker, and he is hereby required to sign an order on the provincial treasurer for the payment of the two thousand pounds, in two yearly payments, to the treasurer of the said hospital, to be applied to the founding, building, and finishing of the same."

This condition carried the bill through, for the members, who had oppos'd the grant, and now conceiv'd they might have the credit of being charitable without the expense, agreed to its passage; and then, in soliciting subscriptions among the people, we urg'd the conditional promise of the law as an additional motive to give, since every man's donation would be doubled; thus the clause work'd both ways. The subscriptions accordingly soon exceeded the requisite sum, and we claim'd and receiv'd the public gift, which enabled us to carry the design into execution. A convenient and handsome building was soon erected; the institution has by constant experience been found useful, and flourishes to this day; and I do not remember any of my political manœuvres, the success of which gave me at the time more pleasure, or wherein, after thinking of it, I more easily excus'd myself for having made some use of cunning.

In Morton's *History of the Pennsylvania Hospital* occur many references to Franklin's connection with the hospital, and from them we learn that in 1754 he was requested to prepare a brief account of the Pennsylvania Hospital, and on May 28, 1754, he presented his manu-

script "Some Account of the Pennsylvania Hospital from its First Beginning to the Fifth Month, called May, 1754." It was ordered that the Clerk, John Smith, get fifteen hundred copies printed, in quarto.

On May 28, 1755, the corner-stone of the hospital on Eighth Street, between Spruce and Pine Streets, was laid; the inscription, which was written by Franklin reads:

IN THE YEAR OF CHRIST
MDCCLV.
GEORGE THE SECOND HAPPILY REIGNING
(FOR HE SOUGHT THE HAPPINESS OF HIS PEOPLE)
PHILADELPHIA FLOURISHING
(FOR ITS INHABITANTS WERE PUBLICK SPIRITED)
THIS BUILDING
BY THE BOUNTY OF THE GOVERNMENT,
AND OF MANY PRIVATE PERSONS,
WAS PIOUSLY FOUNDED
FOR THE RELIEF OF THE SICK AND MISERABLE;
MAY THE GOD OF MERCIES
BLESS THE UNDERTAKING.

On June 30, 1755, Dr. Franklin was unanimously elected President of the Board, to succeed Mr. Crosby, and he presided at the first meeting held in the new building.

Franklin's fines for non-attendance and for lateness at the Manager's meetings, from May, 1755, until May, 1756, amounted to £1.11, he having been fined 2.6 for total absence eleven times, besides two smaller sums of 1.6 each for lateness.

At a meeting of the Board held March 28, 1757, it was resolved that

"The President of the Board, Benjamin Franklin, being appointed Provincial Agent to England and is about to sail in a short time, he is requested after his arrival there, to use his interest in soliciting Donations to the Hospital whenever he may have a Prospect of success therein."

Franklin's own description of his election to the Royal Society and of his receiving the Copley medal, tells how much he was indebted to his medical friends for those honors.

. . . Dr. Wright, an English physician, when at Paris, wrote to a friend, who was of the Royal Society, an account of the high esteem my experiments were in among the learned abroad, and of their wonder that my writings had been so little noticed in England. The Society, on this, resum'd the consideration of the letters that had been read to them; and the celebrated Dr. Watson drew up a summary account of them, and of all I had afterward sent to England on the subject, which he accompanied with some praise of the writer.

This summary was then printed in their Transactions, and some members of the society in London, particularly the very ingenious Mr. Canton, having verified the experiment of procuring lightning from the clouds by a pointed rod, and acquainting them with the success, they soon made me more than amends for the slight with which they had before treated me. Without my having made any application for that honour, they chose me a member, and voted that I should be excus'd the customary payments, which would have amounted to twenty-five guineas; and ever since have given me their transactions gratis. They also presented me with the gold medal of Sir Godfrey Copley for the year 1753; the delivery of which was accompanied by a very handsome speech of the President, Lord Macclesfield, wherein I was highly honoured. . . .

These abstracts above quoted include practically all that appears in regard to medical matters in the *Autobiography*, and I will, therefore, now quote from Franklin's other writings, trying to give them in somewhat chronological order.

CHAPTER II

1731–1759

One of the earliest medical allusions is in a letter to his sister.

Philadelphia, June 19, 1731.

To Mrs. Jane Mecom.

. . . We have had the small-pox here lately, which raged violently while it lasted. There have been about fifty persons inoculated, who all recovered except a child of the Doctor's upon whom the small-pox appeared within a day or two after the operation, and who is therefore thought to have been certainly infected before. In one family in my neighborhood, there appeared a great mortality. The dissolution of this family is generally ascribed to an imprudent use of quicksilver in the cure of the itch. Mr Claypoole applying it as he thought proper, without consulting a physician for fear of charges, and the small-pox coming upon them at the same time, made their case desperate.

But what gives me the greatest concern, is the account you give me of my sister Holmes's misfortune. I know a cancer in the breast is often thought incurable, yet we have here in town a kind of shell made of some wood, cut at a proper time, by some man of great skill, (as they say), which has done wonders in that disease among us, being worn for some time on the breast. I am not apt to be superstitiously fond of believing such things, but the instances are so well attested, as sufficiently to convince the most incredulous. This, if I have interest enough to procure, as I think I have, I will borrow for a time and send it to you, and I hope the doctors you have will at least allow the experiment to be tried and shall rejoice to hear that it has the accustomed effect. . . .

An interesting letter to his father and mother tells us that he at times meddled in the doctor's sphere, but not to excess.

Philadelphia, Sept. 6, 1744.

Honoured Father and Mother:

I apprehend I am too busy in prescribing and meddling in the doctor's sphere, when any of you complain of ails in your letters. But as I

always employ a physician myself, when any disorder arises in my family, and submit implicitly to his orders in everything, so I hope you consider my advice, when I give any, only as a mark of my good will, and put no more of it in practice than happens to agree with what your doctor directs.

Your notion of the use of strong lye I suppose may have a good deal in it. The salt of tartar, or salt of wormwood, frequently prescribed for cutting, opening, and cleansing, is nothing more than the salt of lye procured by evaporation. Mrs. Steven's medicine for a stone and gravel, the secret of which was lately purchased at a great price by the Parliament, has for its principal ingredient salt, which Boerhaave calls the most universal remedy. The same salt intimately mixed with oil of turpentine, which you also mentioned, made the sapo philosophorum, wonderfully extolled by some chemists for like purposes. It is highly probable, as your doctor says, that medicines are much altered in passing between the stomach and bladder; but such salts seem well fitted in their nature to pass with the least alteration of almost anything we know, and, if they will not dissolve gravel and stone, yet I am half persuaded that a moderate use of them may go a great way toward preventing these disorders, as they assist a weaker digestion in the stomach, and powerfully dissolve crudities such as those which I have frequently experienced. As to honey and molasses, I did not mention them merely as openers and loosers, but also from conjecture, that, as they are heavier in themselves than our common drink, they might when dissolved in our bodies increase the gravity of our fluids, the urine in particular, and by that means keep separate and suspended therein those particles, which, when unused, form gravel. . . .

In a very long letter to Cadwallader Colden,[1] of New York, which I cannot give in full, Franklin discusses very logically various anatomical theories, and at the end apologizes for "meddling with matters directly pertaining to your (Colden's) profession, and entirely out of the way of my own." After reading the whole letter one feels that Franklin was well able to discuss such matters, and that he need not have apologized to Colden at all.

[1] Cadwallader Colden, 1688–1776. Born in Scotland, came to America about 1708. Practised medicine in New York, where he was Lieutenant-Governor from 1761 until his death. Wrote a *History of the Five Indian Nations of Canada.*

Philadelphia, August 15, 1745.

To Cadwallader Colden.

. . . I am extremely pleased with your doctrine of the absorbent vessels intermixed with the perspiratory ducts, both on the external and internal superficies of the body. After I had read Sanctorius, I imagined a constant stream of the perspirable matter issuing at every pore in the skin. But then I was puzzled to account for the effects of mercurial unctions for the strangury, sometimes occasioned by an outward application of the flies, and the like, since whatever virtue or quality might be in a medicine laid upon the skin, if it would enter the body, it must go against wind and tide, as one may say. Dr. Hales helped me a little, when he informed me, in his Vegetable Statics, that the body is not always in a perspirable, but sometimes in an imbibing state, as he expresses it, and will at times actually grow heavier by being exposed to moist air.

But this did not quite remove my difficulty, since, as these fits of imbibing did not appear to be regular or frequent, a blistering plaster might lie on the body a week, or a mercurial unguent be used a month, to no purpose, if the body should so long continue in a perspirable state. Your doctrine, which was quite new to me, makes all easy, since the body may perspire and absorb at the same time, through the different ducts destined to those different ends. . . .

. . . I do not remember, that any anatomist, that has fallen in my way, has assigned any other cause of the motion of the blood through its whole circle, than the contractile force of the heart, by which that fluid is driven with violence into the arteries, and so continually propelled by repetitions of the same force, till it arrives at the heart again. May we for our present purpose suppose another cause producing half the effect, and say that the ventricles of the heart, like syringes, draw when they dilate, as well as force when they contract? That this is not unlikely, may be judged from the valves nature has placed in the arteries, to prevent the drawing back of the blood in those vessels when the heart dilates, while no such obstacles prevent its sucking (to use the vulgar expression) from the veins. If this be allowed, and the insertion of the absorbents into the veins and of the perspirants into the arteries be agreed to, it will be of no importance in what direction they are inserted. For, as the branches of the arteries are continually lessening in their diameters, and the motion of the blood decreasing by means of the in-

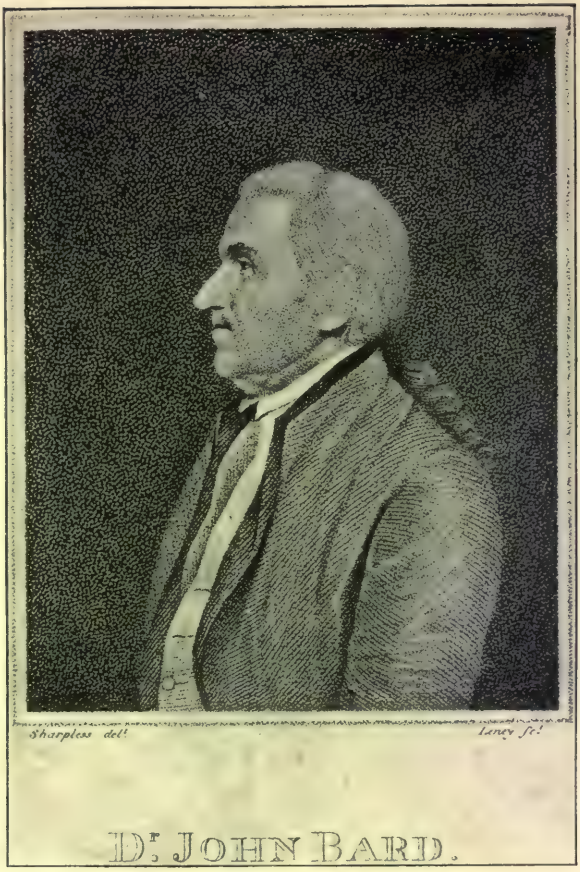


FIG. 6.—Dr. John Bard. From an engraving by Leney, after Sharpless. In the author's collection.

creased resistance, there must, as more is constantly pressed on behind, arise a kind of crowding in the extremities of those vessels, which will naturally force out what is contained in the perspirants that communicate with them. This lessens the quantity of blood, so that the heart cannot receive again by the veins all it had discharged into the arteries, which occasions it to draw strongly upon the absorbents, that communicate with them. And thus the body is continually perspiring and imbibing. Hence after long fasting the body is more liable to receive infection from bad air, and food, before it is sufficiently chylified, is drawn crude into the blood by the absorbents that open into the bowels. . . .

In another letter to Colden he continues this discussion.

Philadelphia, Nov. 28, 1745.

. . . If there is no contrivance in the frame of the auricles or ventricles of the heart, by which they dilate themselves I cannot conceive how they are dilated. It is said, by the force of the venal blood rushing into them. But if that blood has no force given to it by the contraction of the heart, how can it (diminished as it must be by the resisting friction of the vessels it has passed through) be strong enough to overcome that contraction? Your doctrine of fermentation in the capillaries helps me a little; for if the returning blood be rarefied by the fermentation, its motion must be increased; but as it seems to me that it must by its expansion resist the arterial blood behind it, as much as it accelerates the venal blood before it, I am still somewhat unsatisfied. I have heard or read somewhere, too, that the hearts of some animals continue to contract and dilate, or to beat, as it is commonly expressed, after they are separated from the other vessels, and taken out of the body. If this be true, their dilatation is not caused by the force of the returning blood. . . . I have not the original of Dr. Mitchell's[1] tract on the Yellow Fever. Mine is a copy I had taken, with his leave, when here.

. . . I have a friend gone to New York with a view of settling there, if he can meet with encouragement. It is Dr. John Bard,[2] whom

[1] Dr. John Mitchell, physician and botanist, who settled early in the eighteenth century at Urbanna, on the Rappahannock. A friend of Benjamin Franklin's.

[2] John Bard, 1716–1799. Born near Philadelphia; moved to New York, where he practised medicine many years. He was the first President of the Medical Society of New York. Begged Franklin to accept the dedication of one of his works.

I esteem an ingenious physician and surgeon, and a discreet, worthy, and honest man. If, upon conversation with him, you find this character just, I doubt not but you will afford him your advice and countenance, which will be of great service to him in a place where he is entirely a stranger, and very much obliged, Sir, Your most humble servant.

B. Franklin.

In a letter to his mother he exhibits his natural curiosity about diseases:

Philadelphia, Oct. 16, 1749.

To Mrs. Abiah Franklin.

. . . Pray tell us what kind of a sickness you have had in Boston this summer. Besides the measles and flux, which have carried off many children, we have lost some grown persons, by what we call the *Yellow Fever;* though that is almost, if not quite over, thanks to God, who has preserved all our family in perfect health. . . .

The following short article was found by Sparks in Franklin's handwriting among the papers of Cadwallader Colden. It was undated. It is a very clever and concise exposition:

A Conjecture as to the Cause of the Heat of the Blood in Health, and of the Cold and Hot Fits of Some Fevers.

The parts of fluids are so smooth, and roll among one another with so little friction, that they will not by any (mechanical) agitation grow warmer. A phial half full of water shook with violence and long continued, the water neither heats itself nor warms the phial. Therefore the blood does not acquire its heat either from the motion and friction of its own parts, or its friction against the sides of its vessels.

But the parts of solids, by reason of their closer adhesion, cannot move among themselves without friction, and that produces heat. Thus, bend a plummet to and fro, and in the place of bending, it shall soon grow hot. Friction on any part of our flesh heats it. Clapping of the hands warm them. Exercise warms the whole body.

The heart is a thick muscle, continually contracting and dilating nearly eighty times in a minute. By this motion there must be a constant interfriction of its constituent solid parts. That friction must produce a heat, and that heat must consequently be continually communicated to the perfluent blood.

To this may be added, that every propulsion of the blood by the contraction of the heart, distends the arteries, which contract again in the intermission, and this distension and contraction of the arteries may occasion heat in them, which they must likewise communicate to the blood that flows through them.

That these causes of the heat of the blood are sufficient to produce the effect, may appear probable, if we consider that a fluid once warm requires no more heat to be applied to it in any part of time to keep it warm, than what it shall lose in an equal part of time. A smaller force will keep a pendulum going, than what first set it in motion.

The blood, thus warmed in the heart, carries warmth with it to the very extremities of the body, and communicates it to them; but, as by the means its heat is gradually diminished, it is returned again to the heart by the veins for a fresh calefaction.

The blood communicates its heat, not only to the solids of our body, but to our clothes and to a portion of the circumambient air. Every breath, though drawn in cold, is expired warm, and every particle of the materia perspirabilis carries off with it a portion of heat.

While the blood retains a due fluidity, it passes freely through the minutest vessels and communicates a proper warmth to the extremities of the body. But when by any means it becomes viscid, as not to be capable of passing those minute vessels, the extremities, as the blood can bring no more heat to them, grow cold.

The same viscidity in the blood and juices checks or stops the perspiration, by clogging the perspiratory ducts, or, perhaps, by not admitting the perspirable parts to separate. Paper wet with size and water will not dry as soon as if wet with water only.

A vessel of hot water, if the vapour can freely pass from it soon cools. If there be just fire enough under it to add continually the heat it loses, it retains the same degree, If the vessel be closed, so that the vapour may be retained, there will from the same fire be a continual accession of heat to the water, till it rises to a great degree. Or, if no fire be under it, it will retain the heat it first had for a long time. I have experienced, that a bottle of hot water stopped, and put in my bed at night, has retained so much heat seven or eight hours that I could not, in the morning, bear my foot against it, without some of the bedclothes intervening.

During the cold fit, then, perspiration being stopped, great part of the heat of the blood, that used to be dissipated, is confined and retained in the body; the heart continues its motion, and creates a constant accession to that heat; the inward parts grow very hot, and, by contact with the extremities, communicate that heat to them. The glue of the blood is by this heat dissolved, and the blood afterwards flows freely, as before the disorder. . . .

To the Rev. Samuel Johnson[1] he freely gives medical advice, and good sensible advice it is:

Philadelphia, September, 1750.

Dear Sir:

I am sorry to hear of your illness. If you have not been used to the fever-and-ague let me give you one caution. Don't imagine yourself thoroughly cured, and so omit the use of the bark too soon. Remember to take the preventing doses faithfully. If you were to continue taking a dose or two every day for two or three weeks after the fits have left you, 'twould not be amiss. If you take the powder mixed quick in a tea-cup of milk, 'tis no way disagreeable, but looks and even tastes like chocolate. 'Tis an old saying, that an ounce of prevention is worth a pound of cure, and certainly a true one, with regard to the bark; a little of which will do more in preventing the fits than a great deal in removing them.

But if your health would permit, I should not expect the pleasure of seeing you soon. The smallpox spreads apace, and is now in all quarters; yet, as we have only children to have it, and the Doctors inoculate apace, I believe they will soon drive it through the town, so that you may possibly visit us with safety in the spring.

Franklin was a good prognostician judging from his letter to Jared Eliot in which he says:

[1] Samuel Johnson, 1696–1772, of Stratford, Connecticut, scholar and divine. In 1743 was given the degree of Doctor of Divinity from Oxford. Franklin went to Stratford to try and persuade Johnson to accept the position as head of the Academy, which later became, as is well known, the University of Pennsylvania, but he became President of King's College, later Columbia. Mr. David Martin was the Rector or chief professor. Dr. Johnson later suggested the name of William Smith as a likely man and he was chosen the first Provost of the College and Academy of Philadelphia.

Philadelphia, Dec. 10, 1751.

Dear Sir:

The Rector of our Academy, Mr. Martin, came over into this country on a Scheme for making Potash, in the Russian method. He Promis'd me some written Directions for you, which expecting daily, I delay'd writing, and now he lies dangerously ill of a kind of Quinsey. The Surgeons have been oblig'd to open his Windpipe, and introduce a leaden Pipe for him to breathe thro'. I fear he will not recover. . . .

He tells us of the fulfilment of this prophecy in a letter to Samuel Johnson, D.D.

Philadelphia, December 24, 1751.

I wrote to you in my last that Mr. Martin, our Rector, died suddenly of a quinsey. . . .

A sentence in a letter to Cadwallader Colden shows Franklin's interest in therapeutics.

Philadelphia, April 23, '52.

. . . I am heartily glad to hear more Instances of the success of the Poke-Weed, in the Cure of that horrible Evil to the human Body, a Cancer. . . .

Another reference to smallpox appears in the following letter, and demonstrates very plainly how closely Franklin studied this subject.

Philadelphia, Aug. 13, 1752.

To John Perkins,

Sir:

I received your favor of the 3rd instant. Some time last winter I procured from one of our physicians an account of the number of persons inoculated during the five visitations of the small-pox we have had in 22 years; which account I sent to Mr. W. V., of your town, and have no copy. If I remember right, the number exceeded 800, and the deaths were but 4. I suppose Mr. V. will shew you the account, if he ever received it. Those four were all that our doctors allow to have died of the small-pox by inoculation, though I think there were two more of the inoculated who died of the distemper, but the eruptions appearing soon after the operation, it is supposed they had taken the infection before in the common way.

I shall be glad to see what Dr. *Douglas* may write on the subject. I have a *French* piece printed at *Paris*, 1724, entitled *Observations sur la Saignée du Pied, et sur la Purgation, au commencement de la Petite Vérole, et Raisons de Doubte contre l'Inoculation.* A letter of the doctor's is mentioned in it. If he or you have it not, and desire to see it, I will send it. Please to favour me with the particulars of your purging method, to prevent the secondary fever. . . .

On February 17, 1752, John Perkins had written to Franklin telling him that Boston was threatened with an epidemic of small-pox and that some people were trying tar-water as a preventative. He would gladly try anything Mr. Franklin may have heard of.

The next letter is worth quoting in full, giving as it does an account of Franklin's invention of a flexible catheter:

Philadelphia, December 8, 1752.

To John Franklin,

Dear Brother:

Reflecting yesterday on your desire to have a flexible catheter, a thought struck into my mind, how one might probably be made, and lest you should not readily conceive it by any description of mine, I went immediately to the silver-smith's and gave directions for making one (sitting by till it was finished), that it might be ready for this post. But now it is done I have some apprehensions that it may be too large to be easy; if so, a silver-smith can easily make it less by twisting or turning it on a smaller wire, and putting a smaller pipe to the end, if the pipe is really necessary. This machine may either be covered with small fine gut, first cleaned and soaked a night in a solution of alum and salt and water, then rubbed dry, which will preserve it longer from putrefaction; then wet again and drawn on and tied to the pipes at each end, where little hollows are made for the thread to bind in and the surface greased. Or perhaps, it may be used without the gut, having only a little tallow rubbed over it, to smooth it and fill the joints. I think it is as flexible as would be expected in a thing of the kind, and I imagine will readily comply with the turns of the passage, yet has stiffness enough to be protruded; if not, the enclosed wire may be used to stiffen the hinder part of the pipe while the forepart is pushed forward, and as it proceeds the wire may be gradually withdrawn. The tube is of such a nature, that

when you occasion to withdraw it its diameter will lessen, whereby it will move more easily. It is a kind of screw and may be both withdrawn and introduced by turning. Experience is necessary for the right using of all new tools or instruments, and that will perhaps suggest some improvements to this instrument as well as better direct the manner of using it.

I have read Whytt[1] on Lime-Water. You desire my thought on what he says. But what can I say? He relates facts and experiments, and they must be allowed good, if not contradicted by other facts and experiments. May not one guess, by holding limewater some time in one's mouth whether it is likely to injure the bladder?

I know not what to advise, either as to the injection or the operation I can only pray to God to direct you for the best and to grant succes.

I am, my dear brother, yours most affectionately,

B. Franklin.

I found Whytt's experiments are approved and recommended by Dr. Mead.

He never missed an opportunity to stock his mind with information about even the simplest matters of living and health.

Philadelphia, June 6, 1753.

To Joseph Huey,

Sir:

I received your kind Letter of the 2d inst, and am glad to hear that you increase in Strength; I hope you will continue mending, 'till you recover your former Health and firmness. Let me know whether you still use the Cold Bath, and what Effect it has. . . .

There are several references to Franklin's treating patients with electricity, the first appears in a letter to John Lining under date of March 18, 1755, in which he says:

. . . You suppose it a dangerous experiment, but I had once suffered the same myself, receiving by accident, an equal stroke through

[1] Robert Whytt (1714–1766), President of the Royal College of Physicians, of Edinburgh, author of, "On the Virtues of Lime Water in the Cure of Stone." His treatment for stone was simply lime water and soap.

my head, that struck me down, without hurting me; and I had seen a young woman, that was about to be electrified through the feet, (for some indisposition) receive a greater charge through the head, by inadvertently stooping forward to look at the placing of her feet, till her forehead (as she was very tall) came too near my prime-conductor She dropt, but instantly got up again, complaining of nothing. . . .

A curious reference is the following:

Philadelphia, June 26, 1755.

To Peter Collinson.[1]

Please to give the enclos'd concerning an extraordinary Worm bred in a Woman's Liver to Dr. Clephane[2] . . .

In 1754 Dr. Thomas Bond published in Vol. I of *The Medical Observations and Inquiries*, an article entitled "A Worm, and a Horrid One, Found in the Liver." This was written in the form of a letter to Dr. Clephane.

A sample of Franklin's medical treatment is here shown:

Frederictown, Virginia, March 21, 1756. Sunday.

To Mrs. Deborah Franklin,

My Dear Child:

We got here yesterday Afternoon, and purpose sailing to-day if the Wind be fair. Peter was taken ill with a Fever and Pain in his Side before I got to Newcastle. I had him blooded there, and put him into the Chair wrapt up warm, as he could not bear the Motion of the Horse, and got him here pretty comfortably. He went immediately to bed, and took some Camomile Tea, and this Morning is about again and almost well. . . .

[1] Peter Collinson, 1693–1768, English naturalist, Member of Royal Society. Did much for the Philadelphia Library. Franklin's first papers on Electricity were originally communicated to him and were presented by him before the Royal Society. "Experiments and Observations on Electricity, made at Philadelphia, in America, by Mr. Benjamin Franklin, London: E. Cave, 1751." This pamphlet was given to the press by Collinson and again, "Supplemental Experiments and Observations on Electricity, Part II, made at Philadelphia in America, by Benjamin Franklin, Esq., and communicated in several Letters to P. Collinson, Esq., of London, F.R.S. London: E. Cave, 1753."

[2] Dr. John Clephane . . . 1758, Physician to St. George's Hospital.

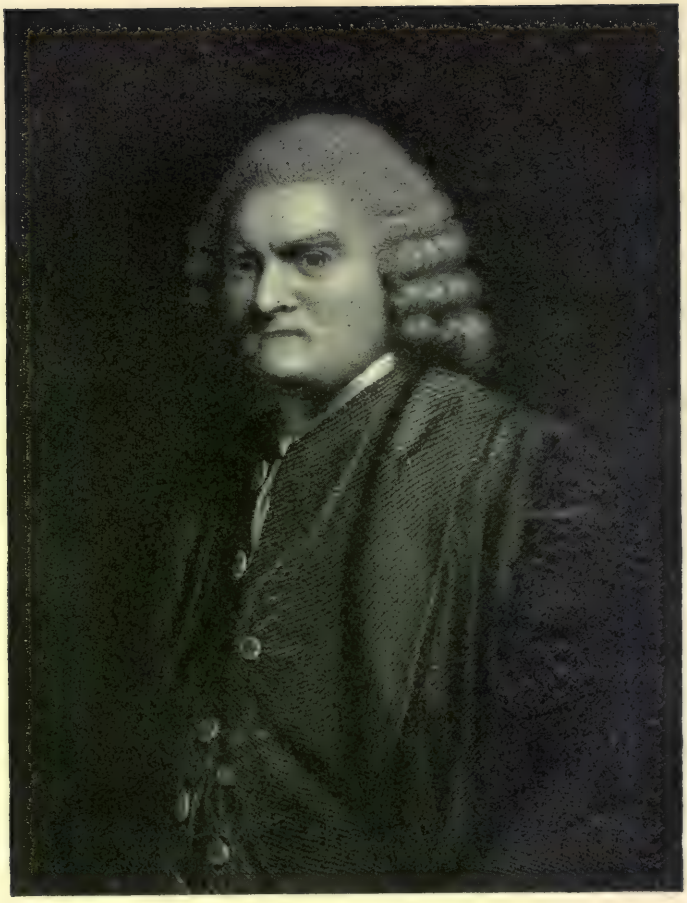


Fig. 7.—Sir John Pringle, M.D. Engraved by Mote, after the painting by Sir Joshua Reynolds.

The next reference to the treatment of cases of nervous diseases by electricity is given in a letter to John Pringle[1] in which Franklin describes his method of treatment and his candid opinion upon the results to be expected. A thoroughly unbiased opinion it seems to be.

A very interesting letter:

Craven Street, Dec. 21, 1757.

To John Pringle,

Sir:

In compliance with your request, I send you the following account of what I can at present recollect relating to the effects of electricity in paralytic cases, which have fallen under my observation.

Some years since, when the newspapers made mention of great cures performed in *Italy* and *Germany*, by means of electricity, a number of paralytics were brought to me from different parts of *Pennsylvania*, and the neighboring provinces, to be electrised, which I did for them at their request. My method was, to place the patient first in a chair, on an electric stool, and draw a number of large sparks from all parts of the affected limb or side. Then I fully charged two six gallon glass jars, each of which had about three square feet of surface coated, and I sent the united shock of these through the affected limb or limbs, repeating the stroke commonly three times each day. The first thing observed, was an immediate greater sensible warmth in the lame limbs that had received the stroke, than in the others; and the next morning the patients usually related, that they had in the night felt a pricking sen-

[1] Sir John Pringle, 1707–1782. A British physician born in Scotland, Chief Physician to the Army in Flanders, Physician to the Queen, President of the Royal Society from 1772 until 1778, when he resigned upon the King's suggestion. The story being that the question arose as to the relative merits of sharp or blunt points on the proposed lightning rods of Kew Palace. The King and his friends believed in blunt points, while the scientists held that sharp points would be preferable. Pringle was asked by the King for his opinion, and was given to understand that he should decide for blunt points. This Sir John refused to do, and hinted that the laws of nature were not changeable at Royal pleasure; and so he lost his place as President. An epigram written by some wit of the time describes this squabble:

"While you, great George, for safety hunt,
And sharp conductors change for blunt,
The nations out of joint.
Franklin a wiser course pursues,
And all your thunder fearless views,
By keeping to the point."

sation in the flesh of the paralytic limbs; and would sometimes shew a number of small red spots, which they supposed were occasioned by those prickings. The limbs, too, were found more capable of voluntary motion, and seemed to receive strength. A man, for instance, who could not, the first day, lift the lame hand from off his knee, would the next day raise it four or five inches, the third day higher, and on the fifth day was able but with a feeble languid motion, to take off his hat. These appearances gave great spirits to the patients, and made them hope a perfect cure; but I do not remember that I ever saw any amendment after the fifth day, which the patients perceiving, and finding the shocks pretty severe, they became discouraged, went home, and in a short time relapsed, so that I never knew any advantage from electricity in Palsies that was permanent. And how far the apparent temporary advantage might arise from the exercise in the patents' journey coming daily to my house, or from the spirits given by the hope of success enabling them to exert more strength in moving their limbs, I will not pretend to say.

Perhaps some permanent advantage might have been obtained, if the electric shocks had been accompanied with proper medicine and regimen, under the direction of a skillful physician. It may be, too, that a few great strokes, as given in my method, may not be so proper as many small ones, since, by the account from *Scotland* of a case in which two hundred shocks from a phial were given daily, it seems, that a perfect cure has been made. As to any uncommon strength supposed to be in the machine used in that case, I imagine it could have no share in the effect produced, since the strength of the shock from charged glass is in proportion to the quantity of surface of the glass coated, so that my shocks from those large jars must have been much greater than any that could be received from a phial held in the hand. I am, with great respect, Sir,

Your most obedient servant,

B. Franklin.

That Sir John thought well of Franklin's views on this subject is apparent in this letter that he wrote him.

Dear Sir:

I take the liberty to beg that you would come as soon as you can to the Duke of Ancaster's in Berkely Square, as His Grace and the Duchess are in the greatest distress about their Daughter, who has been long in a most miserable condition with spasms and convulsions. After all that we have done, the distemper remains obstinate and therefore the Parents have thought of electrifying Her. I have recommended the operation to be performed by Spence and the rather as the present spasm has shut the young Lady's jaw and deprived Her both of speech and swallowing. I ventured to name you as the person most proper for directing the operation, trusting to your friendship to me and humanity towards the distressed. Their Graces both join in begging this favour, and I gave them hopes that you would not refuse it.

I am Dr Sir,
Your most affectionate humble servant
John Pringle.

Berkeley Square, Friday, 11 o'cl.

As the young lady is at Chelsea, the Duke's coach is sent to bring you first to the Duke's house in Berkeley Square and afterwards to Chelsea.

In a very long letter to John Lining[1] under date of June 17, 1758, in which Franklin discusses the subject of evaporation and its effect upon bodily temperature, a very readable discourse, but too long for quotation, he ends with the to him never-to-be-neglected practical side of the subject thus:

. . . To these queries of imagination, I will only add one practical observation, that where ever it is thought proper to give ease, in cases of painful inflamation in the flesh (as from burnings, or the like), by cooling the part, linen cloths wet with spirit, and applied to the part inflamed, will produce the coolness required, better than if wet with water, and will continue it longer. For water, though cold when first applied, will soon acquire warmth from the flesh, as it does not evaporate fast enough, but the cloths wet with spirit, will continue cold as long

[1] Dr. John Lining, 1708–1760, practised medicine in Charlestown, South Carolina. Wrote in 1753 a "History of Yellow Fever."

as any spirit is left to keep up the evaporation, the parts warmed escaping as soon as they are warmed, and carrying off the heat with them.

I am, Sir, etc.,

B. F.

In 1759 Franklin prevailed upon Dr. William Heberden to write an account of the success of inoculation as a means of protection against smallpox. This pamphlet now very rare was distributed in America at that time in large numbers. Dr. Henry K. Cushing, of Cleveland, Ohio, wrote a few years ago an article entitled "Notes Suggested by the Franklin-Heberden Pamphlet of 1759." This article appeared in *The Johns Hopkins Hospital Bulletin*, September, 1904, vol. xv, No. 162. From this I learn that in the original Franklin-Heberden pamphlet an introduction written by Franklin fills four pages, while Dr. Heberden has contributed eight. This whole pamphlet is, I think, worthy of reproduction, not only on account of its great rarity, but because of the most interesting account it gives us of the method and success of inoculation as practised in those days, but I feel that the part written by Dr. Heberden is too long, and will reprint merely the letter or introduction written by Franklin.

SOME
ACCOUNT
OF THE SUCCESS OF
INOCULATION
FOR THE
SMALL-POX
IN
ENGLAND AND AMERICA
TOGETHER WITH
PLAIN INSTRUCTIONS,
BY WHICH ANY PERSON MAY BE ENABLED TO PERFORM THE OPERATION, AND CONDUCT THE PATIENT THROUGH THE DISTEMPER.

LONDON:
PRINTED BY W. STRAHAN, M. DCC. LIX.

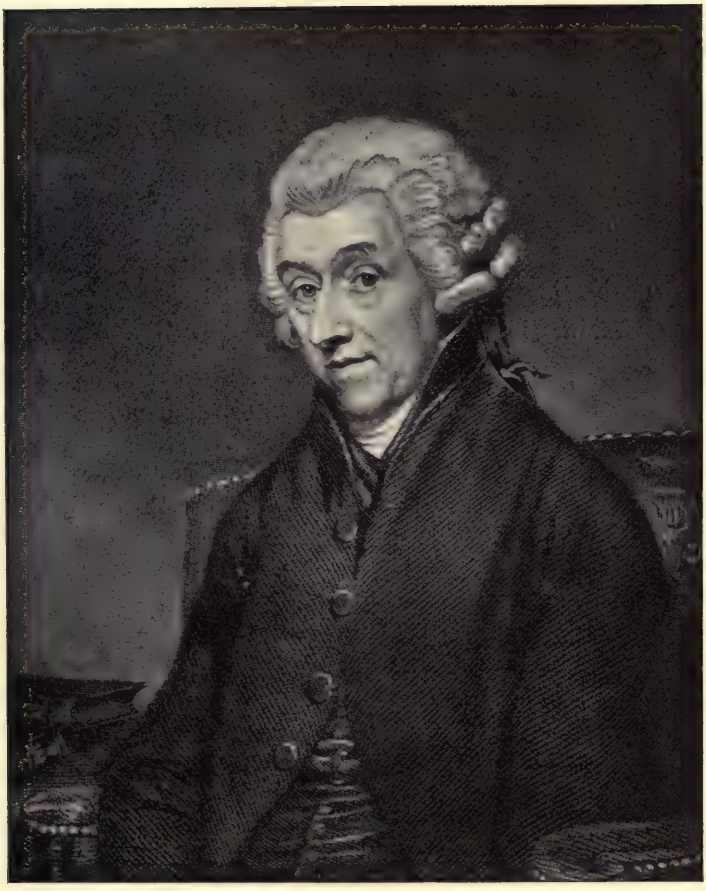


Fig. 8.—Dr. William Heberden. Engraved by J. Thomson, from the portrait by Sir W. Beechey.

London, Feb. 16, 1759.

Having been desired by my greatly esteemed friend, Dr. William Heberden, F.R.S., one of the principal Physicians of this city, to communicate what account I had of the success of Inoculation in Boston, New-England, I some time since wrote and sent to him the following paper, viz.:

About 1753 or 54, the small-pox made its appearance in Boston, New-England. It had not spread in the town for many years before, so that there were a great number of the inhabitants to have it. At first, endeavors were used to prevent its spreading, by removing the sick, or guarding the houses in which they were; and with the same view Inoculation was forbidden; but when it was found that these endeavors were fruitless, the distemper breaking out in different quarters of the town, and increasing, Inoculation was then permitted.

Upon this, all that inclined to Inoculation for themselves or families hurried into it precipitately, fearing the infection might otherwise be taken in the common way; the numbers inoculated in every neighborhood spread the infection likewise more speedily among those who did not chuse Inoculation; so that in a few months the distemper went thro' the town, and was extinct; and the trade of the town suffered only a short interruption, compar'd with what had been usual in former times, the country people during the seasons of that sickness fearing all intercourse with the town.

As the practice of Inoculation always divided people into parties, some contending warmly for it, and others as strongly against it; the latter asserting that the advantages pretended were imaginary, and that the Surgeons, from views of interest, conceel'd or diminish'd the true number of deaths occasion'd by Inoculation, and magnify'd the number of those who died of the Small-pox in the common way: It was resolved by the Magistrates of the town, to cause a strict and impartial enquiry to be made by the Constables of each ward, who were to give in their returns upon oath; and that the enquiry might be made more strictly and impartially, some of the partisans for and against the practice were join'd as assistants to the officers, and accompany'd them in their progress through the wards from house to house. Their several returns being received, and summed up together, the numbers turn'd out as follows,

Had the Small-pox in the common way.		Of these died.		Received the distemper by Inoculation.		Of these died.	
Whites	Blacks	Whites	Blacks	Whites	Blacks	Whites	Blacks
5059	485	452	62	1974	139	23	7

It appeared by this account that the deaths of persons inoculated, were more in proportion at this time than had been formerly observed, being something more than one in a hundred. The favourers of Inoculation however would not allow that this was owing to any error in the former accounts, but rather to the Inoculating at this time many unfit subjects, partly through the impatience of people who would not wait the necessary preparation, lest they should take it in the common way; and partly from the importunity of parents prevailing with the Surgeons against their judgment and advice to inoculate weak children, labouring under other disorders; because the parents could not immediately remove them out of the way of the distemper, and thought they would at least stand a better chance by being inoculated than in taking the infection as they would probably do, in the common way.

The Surgeons and Physicians were also suddenly oppressed with the great hurry of business, which so hasty and general an Inoculation and spreading of the distemper in the common way must occasion, and probably could not so particularly attend to the circumstances of the patients offered for Inoculation.

Inoculation was first practiced by Dr. Boylstone in 1720.[1] It was not used before in any part of America, and not in Philadelphia till 1730. Some years since, an enquiry was made in Philadelphia of the several Surgeons and Physicians who had practis'd Inoculation, what numbers had been by each inoculated, and what was the success. The result of this enquiry was that upwards of 800 (I forget the exact number) had been inoculated at different times, and that only four of them had died. If this account was true, as I believe it was, the reason of greater success then than had been found in Boston, where the general loss by Inoculation used to be estimated at about one in 100, may probably be from this circumstance; that in Boston they always keep the distemper

[1] The year was 1721

out as long as they can, so that when it comes, it finds a greater number of adult subjects than in Philadelphia, where since 1730 it has gone through the town once in four or five years, so that the greatest number of subjects for Inoculation must be under that age.

Notwithstanding the now uncontroverted success of Inoculation it does not seem to make that progress among the common people in America, which at first was expected. Scruples of conscience weigh with many concerning the lawfulness of the practice: And if one parent or near relation is against it, the other does not chuse to inoculate a child without free consent of all parties, lest in case of a disastrous event, perpetual blame should follow.

These scruples a sensible Clergy may in time remove. The expense of having the operation performed by a Surgeon weighs with others, for that has been pretty high in some parts of America; and when a common tradesman or artificer has a number in his family to have the distemper, it amounts to more money than he can well spare. Many of these, rather than own the true motive for declining Inoculation, join with the scrupulous in the cry against it, and influence others. A small pamphlet wrote in plain language by some skilful Physician, and publish'd, directing what preparations of the body should be used before the Inoculation of children, what precautions to avoid giving the infection at the same time in the common way, and how the operation is to be performed, the incisions dressed, the patient treated, and on the appearance of what symptoms a Physician is to be called, &c., might, by encouraging parents to inoculate their own children, be a means of removing that objection of the expense, render the practice much more general, and thereby save the lives of thousands.

The Doctor, after perusing and considering the above, humanely took the trouble (tho' his extensive practice affords him scarce any time to spare) of writing the following Plain Instructions,[1] and generously at his own private expense, printed a very large impression of them, which was put into my hands to be distributed gratis in America. Not aiming at the prize which however is justly due to such disinterested benevolence, he has omitted his name; but as I though the advice of a

[1] To make them the plainer and more generally intelligible, the Doctor purposely avoided, as much as possible, the medical terms and expressions used by Physicians in their writings.

nameless Physician might possibly on that account be less regarded I have, without his knowledge, here divulged it. And I have prefixed to his small but valuable work these pages, containing the facts that have given rise to it; because facts generally have, as indeed they ought to have, great weight in persuading to the practice they favour. To these I may also add an account I have been favoured with by Dr. Archer, physician to the Small-pox Hospital here, viz.:

	PERSONS.
There have been inoculated in this Hospital since its first institution to this day, Dec. 31, 1758	1601
Of which number died	6
Patients who had the Small-pox in the common way in this Hospital, to the same day	3856
Of which number have died	1002

By this account it appears, that in the way of inoculation there has died but one patient in 267, whereas in the common way there has died more than one in four. The mortality indeed in the latter case appears to have been greater than usual, (one in seven, when the distemper is not very favourable, being reckoned the common loss in towns by the Small-pox, all ages and ranks taken together) but these patients were mostly adults, and were received, it is said, into the Hospital after great irregularities had been committed. By the Boston account it appears, that, Whites and Blacks taken together, but about one in eleven died in the common way, and the distemper then was therefore reckoned uncommonly favourable. I have also obtained from the Foundling Hospital (where all the children admitted, that had not had the Small-pox, are inoculated at the age five years) an account to this time of the success of that practice there, which stand thus, viz.:

Inoculated, boys 162, girls 176, in all	338
Of these died in Inoculation, only	2
An the death of one of these two was occasioned by a worm fever.	

On the whole, if the chance was only as two to one in favour of the practice among children, would it not be sufficient to induce a tender parent to lay hold of the advantages?

But when it is so much greater, as it appears to be by these accounts (in some even as thirty to one) surely parents will no longer refuse to

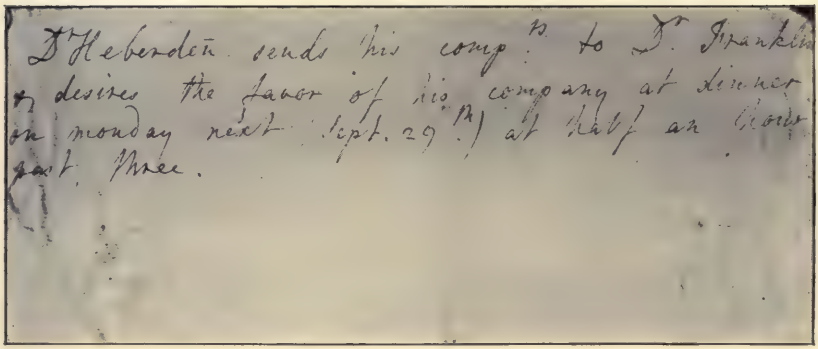

Dr Heberden sends his comp.ts to Dr. Franklin
& desires the favor of his company at dinner
on monday next Sept. 29th at half an hour
past three.

FIG. 9.—Dinner Invitation of Dr. Heberden to Franklin. From the original in the possession of the author.

accept and thankfully use a discovery God in his mercy has been pleased to bless mankind with: whereby some check may now be put to the ravages that cruel disease has been accustomed to make, and the human species be again suffered to increase as it did before Small-pox made its appearance. This increase has indeed been more obstructed by that distemper than is usually imagin'd: For the loss of one in ten thereby is not merely the loss of so many persons, but the accumulated loss of all the children and children's children the deceased might have had, multiplied by successive generations.

B. Franklin,
of Philadelphia.

CHAPTER III

1761–1769

A NUMBER of Franklin's letters to Miss Stevenson[1] contain pertinent allusions to medicine, among them the example here copied:

Craven St., Aug. 10, 1761.

Dear Polly:

. . . I have a singular Opinion on this subject, which I will venture to communicate to you, tho' I doubt you will rank it among my Whims. It is certain that the Skin has imbibing as well as discharging pores, witness the Effect of a Blister Plaister, etc. I have read, that a Man, hired by a physician to stand by way of Experiment in the open Air naked during a moist Night, weighed near 3 Pounds heavier in the Morning. I have often observed myself, that however thirsty I may have been going into the Water to swim, I am never so in the Water. These imbibing Pores, however, are very fine, perhaps fine enough in filtring to separate Salt from Water, for, tho' I have soak'd by Swimming, when a Boy, several Hours in the Day for several Days successively in Salt water, I never found my Blood and Juices salted by that means, so as to make me thirsty or feel a salt Taste in my Mouth; and it is remarkable, that the Flesh of the Sea Fish, tho' bred in Salt Water, is not Salt.

Hence I imagine, that, if People at sea, distress'd by Thirst when their fresh Water is unfortunately spent, would make Bathing Tubs of their empty Water-Casks, and, filling them with Sea Water, sit in them an hour or two each Day, they might be greatly reliev'd. Perhaps keeping their Clothes constantly wet might have an almost equal Effect, and this

[1] Mrs. Margaret Stevenson kept a boarding house at No. 7 Craven St., London, and here Benjamin Franklin lived during the fifteen years of his stay in London. Her daughter, Mary Stevenson, was a great friend of Benjamin Franklin's and to her he wrote many of his most interesting and delightful letters. Miss Stevenson married Dr. Wm. Hewson, and after her husband's death, at Dr. Franklin's suggestion, she removed with her children to Philadelphia.

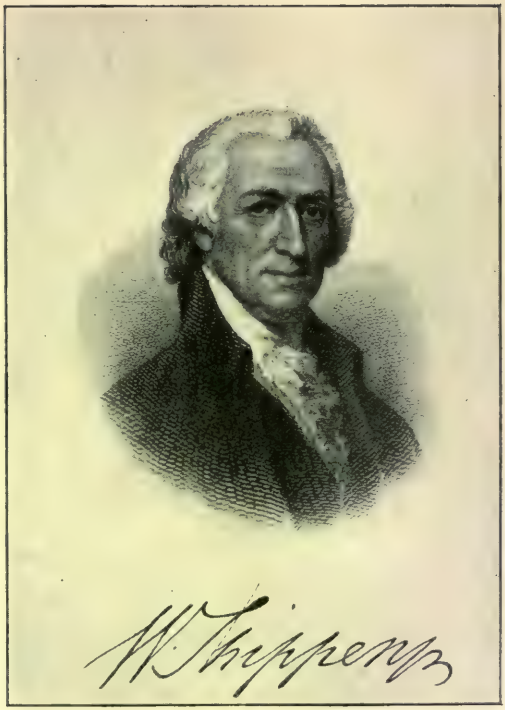


FIG. 10.—Dr. William Shippen, Jr. Etched by H. Wright Smith after the painting by Stuart.

without Danger of catching cold. Men do not catch Cold by wet Clothes at Sea. Damp, but not wet Linen may possibly give Colds, but no one catches cold by Bathing, and no Clothes can be wetter than Water itself. Why damp Clothes should then occasion Colds, is a curious Question, the Discussion of which I reserve for a future Letter or some future Conversation.

Adieu my dear Little Philosopher. Present my respectful Compliments to the good Ladies, your Aunts, and to Miss Pitt, and believe me ever, Your affectionate Friend,

and Humble Servant,

B. Franklin.

The following letter demonstrates how much Dr. Shippen[1] and Dr. Morgan were indebted to Franklin for their reception in Edinburgh, where they both graduated. As is of course well known, these two young men were the founders of the present Medical Department of the University of Pennsylvania.

London, Oct. 21, 1761.

To William Cullen,[2] M.D.

. . . I thank you for the civilities you were so good as to shew my friend, Mr. Shippen, whom I took the liberty of recommending to your notice the last year. The bearer, Mr. Morgan, who purposes to reside some time in Edinburgh for the completion of his studies in Physic, is a young gentleman of Philadelphia, whom I have long known and

[1] William Shippen, Jr., 1736–1808. Graduated from the College of New Jersey and then went abroad, receiving the degree of Doctor of Medicine from the University of Edinburgh in 1762. He studied Anatomy with John Hunter, and Midwifery under William Hunter and Dr. McKenzie. On his return home in 1762, he delivered private courses of lectures upon Anatomy, with dissections, and upon Midwifery, which were the first given in this country. He was largely instrumental in instituting the practice of this branch of medicine among physicians. On September 17, 1765, he was elected Professor of Anatomy and Surgery in the College of Philadelphia. In 1777 he was appointed by Congress to succeed Dr. Morgan as Director General of the Medical Department of the Army.

[2] William Cullen, 1712–1790. A great physician, born in Scotland, who began life as a poor barber, became an apothecary, then a ship surgeon, then the surgeon to a small village, later professor of chemistry and then of Medicine in Glasgow, and finally held the same positions successively at Edinburgh. Founder of a system of medicine called Solidism. Author of a number of medical works.

greatly esteem; and as I interest myself in what relates to him, I cannot but wish him the advantage of your conversation and instructions. I wish it also for the sake of my country, where he is to reside, and where I am persuaded he will be not a little useful. I am, with the greatest esteem and respect, Dear Sir, your most obedient and most humble servant. B. Franklin.

Again in another letter Dr. Franklin introduced John Morgan[1] to Lord Kames[2] in the following words:

London, Nov., 1761.

To Lord Kames:

. . . May I take the freedom of recommending the bearer, Mr. Morgan, to your Lordship's protection. He purposes residing some time in Edinburgh, to improve himself in the study of physic, and I think will one day make a good figure in the profession, and be of some credit to the school he studies in, if great industry and application, joined with natural genius and sagacity, afford any foundation for the presage. He is a son of a friend and near neighbor of mine in Philadelphia, so that I have known him from a child, and am confident the same excellent dispositions, good morals, and prudent behaviour, that

[1] John Morgan, 1735–1789. Graduated in 1757 from the College of Philadelphia in the first class that received literary honours in that institution. Spent six years apprenticeship with Dr. John Redman. Served four years in the Army as Surgeon during the French war. Went to Europe in 1760 and worked under Dr. William Hunter. Graduated in 1763 from the University of Edinburgh. He then traveled through France and Italy. While abroad he was made a Fellow of the Royal Society, member of the Belles Lettres Society of Rome, and a licentiate of the Royal Colleges of Physicians of London and Edinburgh. Returned to Philadelphia in 1765 and began the practice of medicine. He did away with the custom of Physicians dispensing their own drugs, bringing an apothecary with him from England. On May 3, 1765, he was elected Professor of the Theory and Practice of Physic in the College of Philadelphia thereby being entitled to be called the founder of Public Medical Instruction in the United States. He took an active part in the foundation of the American Philosophical Society. In 1772 he went to Jamaica and raised about two thousand pounds for the College. In 1775 he was appointed by Congress, Director General to the Military Hospitals, and Physician-in-Chief to the American Army and immediately joined Washington at Cambridge. In 1777 he was dismissed from the service, being blamed for the inefficiency of the Medical Department of the Army. In 1779 a committee appointed by Congress, however, thoroughly vindicated Dr. Morgan. He was physician to the Pennsylvania Hospital for many years.

[2] Henry Home, Lord Kames, 1696–1782. A celebrated Scottish judge and author.

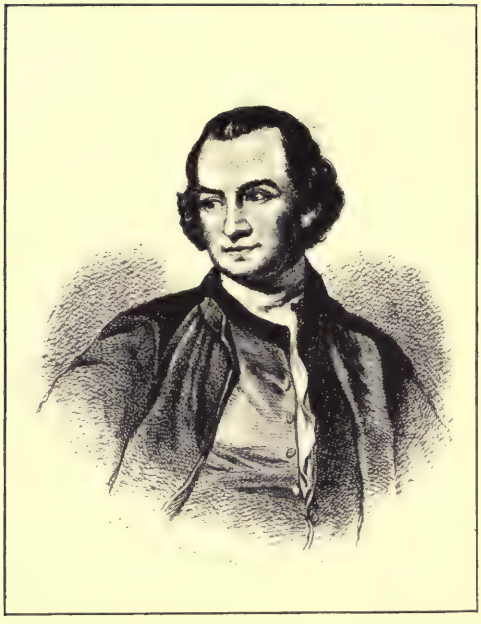


FIG. 11.—Dr. John Morgan. Etched by H. B. Hall after the portrait by Angelica Kauffman in the possession of the University of Pennsylvania.

FIG. 12.—Dr. John Morgan's Diploma from the University of Edinburgh. From the original in the College of Physicians of Philadelphia.

have procured him the esteem and affection of all that knew him in his own country, will render him not unworthy the regard, advice, and countenance your Lordship may be so good as to afford him. . . .

A reference in another letter shows who were his medical friends in Edinburgh.

Phila., Dec. 11, 1763.

To Sir Alexander Dick.

. . . Be pleased to present my Respects to our Friends the Russels,[1] when you see them, to the two Doctors Monro,[2] Dr. Cullen, Dr. Clark, M. M'Gawn, and any others who may do me the Honour to enquire after me. . . .

To his good friend, Dr. Fothergill, Benjamin Franklin wrote this humorous letter.

March 14, 1764.

To John Fothergill, M.D.[3]

Dear Doctor: I received your favour of the 10th of December. It was a great deal for one to write whose time was so little his own. By the way, when do you intend to live? *i. e.*, to enjoy life. When will you retire to your villa, give yourself repose, delight in viewing the operations of nature in the vegetable creation, assist her in her works, get your ingenious friends at times about you, make them happy with your conversation, and enjoy theirs; or if alone, amuse yourself with your books and elegant collections?

To be hurried about perpetually from one sick chamber to another is not living. Do you please yourself with the fancy that you are doing good? You are mistaken. Half the lives you save are not worth saving, as being useless, and almost all the other half ought not to be

[1] Alexander Russell, 1715–1768, had been physician to the English factory at Aleppo. He wrote "Natural History of Aleppo," and was elected F.R.S. in 1756.

[2] Alexander Monro, Primus, 1697–1767. An eminent physician and anatomist. He was instrumental in founding the Medical School of Edinburgh where he was Professor of Anatomy and Surgery. He was a Fellow of the Royal Society of London and a member of the Academy of Surgery in Paris. Alexander Monro, Secundus, 1732–1817. Son of the preceding, whom he succeeded in the Chair of Anatomy and Surgery in the University of Edinburgh, in 1759.

[3] John Fothergill, 1712-1780. An eminent Quaker physician, born in Yorkshire. Graduated at Edinburgh, settled in London where he obtained a large practice. He wrote on numerous subjects.

saved, as being mischievous. Does your conscience never hint to you the impiety of being in constant warfare against the plans of Providence? Disease was intended as the punishment of intemperance, sloth, and other vices, and the example of that punishment was intended to promote and strengthen the opposite virtues. But here you step in officiously with your Art, disappoint those wise intentions of nature, and make men safe in their excesses, whereby you seem to me to be of just the same service to society as some favourite first minister who out of the great benevolence of his heart should procure pardons of all criminals that applied to him; only think of the consequences.

One more reference to Dr. John Morgan is found in the letter herewith abbreviated, and also to another young medical student helped by Dr. Franklin.

Cravenstreet, London, June 2, 1765.

To Sir Alexander Dick,[1]

Dear Sir:

I received your kind Congratulations on my Return to Britain, by Mr. Alexander, which was very obliging. The Slip to Dr. Morgan I sent after him to America, where I hope he is safely arrived before this time. He always express'd himself greatly oblig'd to you for the Notice you took of him and the Countenance you afforded him, and I shall always thank you cordially for the Regard you were so good as to pay my Recommendation. I think he will prove of great Use to his Country as well as an Honour to the Medical School of Edinburgh. . . .

. . . There is now at Edinburgh a young Gentleman of America, Mr. Samuel Bard,[2] Son of a Friend of mine. He is studying Physic there. I have known him from a Child, and always had an Affection for him, as he appear'd to have the most amiable Dispositions. I

[1] Sir Alexander Dick, 1703-1785. A Scottish physician. Author of a treatise on Epilepsy.

[2] Samuel Bard, 1742-1821. Born in Philadelphia; son of Dr. John Bard. Studied at Kings College. Graduated at Edinburgh in 1765. Returned to America and was appointed first Professor of the Practice of Physic in the Kings College upon the organization of its medical department in 1767. He was instrumental in founding the New York Hospital and the Dispensary in the same city. President of the College of Physicians and Surgeons. Published in 1771 a paper on "Angina Suffocativa."

Fig. 13.—Dr. Alexander Russell. Engraving by Trotter, from the portrait by Dance.

FIG. 14.—Dr. Alexander Monro, Sen. Engraved by T. Cook, from the portrait by Allan Ramsay.

Fig. 15.—Library and Surgeons' Hall in Fifth Street, Philadelphia.
Engraved by Birch.

beg your Countenance towards him, and that you would occasionally favour him with your Advice in his Studies. . . .

John Morgan wrote to Dr. Franklin Oct. 10, 1765, from Philadelphia, and after thanking him most warmly for many kindnesses and especially for advancing the money for his fees to the Royal Society to which Morgan had just been elected, said:

. . . I thank you also for your kind Congratulations on my being elected Professor of Medicine in the College. I shall by this vessel send You a printed Copy of my Discourse which I shewed you in MS. Before I quit this, give me leave to inform You that on the 5th Ult, I was Marry'd to Miss Molly Hopkinson who is well and joins me in sincere Compliments to You. Please to present my best respects to Dr. Watson to whom I would now write but for want of leisure. I remain with great respect Sir, Your much obliged Friend and most obedient humble Servant

John Morgan.

Phila., Pa., Oct. 10, 1765.

The medical school was situated in what was known as Surgeons' Hall next to the Philadelphia Library, founded by Dr. Franklin.

In the following letter Franklin shows strikingly his common sense in matters relating to health.

London, June 13, 1766.

To Mrs. Deborah Franklin.

. . . I am now nearly well again, but feeble. To-morrow I set out with my Friend, Dr. Pringle (now Sir John) on a Journey to Pyrmont, where he goes to drink the Waters, but I hope more from the Air and Exercise, having been used, as you know, to have a Journey once a Year, the want of which last Year, has, I believe, hurt me, so that tho' I was not quite to say sick, I was often ailing last Winter, and thro' the Spring. We must be back at farthest in Eight Weeks, as my Fellow Traveller is the Queen's Physician, and has leave for no longer as she will then be near her Time. . . .

Very little is known of this journey taken by Franklin and Pringle together through part of Europe. Mr. J. G. Rosengarten in his

American History from German Archives with Reference to the German Soldiers in the Revolution and Franklin's Visit to Germany, dwells upon their visit to Göttingen and the subsequent effect that this had upon the views held by the Germans during the Revolution.

No letters of Franklin exist written during this period, and he makes no reference of any value in subsequent letters and he apparently kept no diary during the two months they were on the continent. It was probably a very enjoyable holiday jaunt.

His interest in the Pennsylvania Hospital can be seen by this excerpt not to have flagged.

London, May 5, 1767.

To Cadwallader Evans,[1]

Dear Doctor:

. . . I am pleased with your scheme of a Medical Library at the Hospital, and I fancy I can procure you some donations among my medical friends here, if you will send me a catalogue of what books you already have. Enclosed I send you the only book of the kind in my possession here, having just received it as a present from the author. It is not yet published to be sold, and will not be for some time, till the second part is ready to accompany it.

I thank you for your remarks on the gout. They may be useful to me, who have already had some touches of that distemper. As to Lord Chatham, it is said that his constitution is totally destroyed and gone, partly through the violence of the disease, and partly by his own continual quacking with it. There is at present no access to him. . . .

A light is thrown by the following on Franklin's universal knowledge, and of the multifareous things, he thought, wrote, and talked about.

[1] Dr. Cadwallader Evans, 1726-1773, was one of Dr. Thomas Bond's first pupils. He then sailed for England intending to study further at Edinburgh. At the time war existed between Spain, France, and England, and the vessel in which he sailed was captured by a Spanish privateer and he was taken to Hayti. He then went to Jamaica where he practiced medicine for about two years, when he sailed for England. He spent a year in Edinburgh and London and then returned to Philadelphia. He was physician to the Pennsylvania Hospital from 1759 until his death in 1773. He was, according to Franklin, the founder of the Medical Library in that Institution.

Fig. 16.—Dr. John Fothergill. From a Wedgwood medallion, modelled by John Flaxman, R. A. In the author's collection.

He neglected nothing, and everything to him had some significance and was worthy of consideration.

London, August 5, 1767.

To George Croghan,

Sir:

I return you many thanks for the box of elephants' tusks and grinders. They are extremely curious on many accounts; no living elephants having been seen in any part of America by any of the Europeans there, or remembered in any traditions of the Indians. It is also puzzling to conceive what should have brought so many of them to die on the same spot, and that no such remains should be found in any other part of the continent, except in that very distant country, Peru, from whence some grinders of the same kind formerly brought, are now in the museum of the Royal Society. The tusks agree with those of the African and Asiatic elephant in being nearly of the same form and texture, and some of them, notwithstanding the length of time they must have lain, being still good ivory. But the grinders differ, being full of knobs, like the grinders of a carnivorous animal; when those of the elephant, who eats only vegetables, are almost smooth. But then we know of no other animal with tusks like an elephant, to whom such grinders might belong.

It is remarkable, that elephants now inhabit naturally only hot countries where there is no winter, and yet these remains are found in a winter country; and it is no uncommon thing to find elephants' tusks in Siberia, in great quantities, when their rivers overflow, and wash away the earth, though Siberia is still more a wintry country than that on the Ohio, which looks as if the earth had anciently been in another position, and the climates differently placed from what they are at present.

With great regard, I am, Sir,
Your most obedient humble servant,
B. Franklin.

In 1767 Wm. Shippen, Jr., wrote Franklin about two children joined firmly together at the breast-bone, and tells him that he sends a wax model and an account of the dissection for the Royal Society.

Franklin's advice about sea-sickness is as sound as that on almost every other subject.

Paris, Sept. 14, 1767.

To Miss Mary Stevenson.

. . . Soon after I left you in that agreeable Society at Bromley, I took the Resolution of making a Trip with Sir John Pringle into France. . . . At Dover, the next Morning, we embark'd for Calais with a number of Passengers, who had never been before at sea. They would previously make a hearty Breakfast, because if the Wind should fail, we might not get over till Supper time. Doubtless they thought that when they had paid for their Breakfast, they had a Right to it, and that when they had swallowed it they were sure of it. But they had scarce been out half an Hour, before the Sea laid Claim to it, and they were obliged to deliver it up. So it seems there are Uncertainties, even beyond those between the Cup and the Lip. If ever you go to sea, take my Advice, and live sparingly a Day or two beforehand. The Sickness, if any, will be lighter and sooner over. . .

Franklin's letters on the subject of lead-poisoning have really become classics in medical literature. The following one to Dr. Cadwallader Evans contains a short reference.

London, February 20, 1768.

To Cadwallader Evans,

Dear Sir:

I wrote you a few lines by Captain Falconer, and sent you Dr. Watson's new piece of Experiments in Inoculation, which I hope will be agreeable to you.

In yours of November 20th, you mention the lead in the worms of stills as a probable cause of the dry belly-ache among punch-drinkers in our West Indies. I had before acquainted Dr. Baker with a fact of that kind, the general mischief done by the use of leaden worms, when rum-distilling was first practiced in New England, which occasioned a severe law there against them, and he has mentioned it in the second part of his piece not yet published. I have long been of opinion, that that distemper proceeds always from a metallic cause only; observing that it affects, among trades-men, those that use lead, however different their trades,—as glaziers, letter-founders, plumbers, potters, white-

lead makers, and painters; (from the latter, it has been conjectured, it took its name *colica Pictonum*, by the mistake of a letter, and not from its being the disease of Poictou) and, although the worms of stills ought to be of pure tin, they are often made of pewter, which has a great mixture in it of lead. . . .

Dr. John Hunter founded his essay on the "Dry belly-ache of the Tropics" upon Franklin's letters, giving the credit freely to him for the suggestions. An interesting letter is the following.

London, July 28, 1768.

To Barbeu Dubourg.[1]

I greatly approve the epithet which you give, in your letter of the 8th of June, to the new method of treating the small-pox, which you call the tonic or bracing method; I will take occasion from it to mention a practice to which I have accustomed myself.

You know the cold bath has long been in vogue here as a tonic; but the shock of the cold water has always appeared to me, generally speaking, as too violent, and I have found it much more agreeable to my constitution to bathe in another element, I mean cold air. With this view I rise almost every morning, and sit in my chamber without any clothes whatever, half an hour or an hour, according to the season, either reading or writing. This practice is not in the least painful, but, on the contrary, agreeable; and, if I return to bed afterwards, before I dress myself, as sometimes happens, I make a supplement

[1] Barbeu Dubourg, 1709-1779, a French physician. French editor of Franklin's works, "Œuvres de M. Franklin, Docteur ès Loix, Traduites de l'Anglois sur la quatrieme édition. Par M. Barbeu Dubourg, avec des additions nouvelles et des Figures en Taille douce. Paris, 1773." In 1761 published a Gazette of Medicine and in 1767 the "Botaniste Française." Dedicated to Franklin his "Petit Code de la Raison Humaine," the first edition of which was published in 1774, the second in 1782 at Franklin's press at Passy. Member of the Clinical Philosophical Society, Medical Society of London, Member of Royal Society of Medicine of Paris, Academy of Stockholm. He gave up the practice of medicine and devoted himself to the American cause during the Revolution. Franklin notes in his journal that on Dec. 29, 1780, "Went by particular invitation to the Sorbonne, to an Assembly of the Faculty of Physick in the College Hall; where we had the eloge of my friend, M. Dubourg, and other pieces. Suffer'd by cold." Franklin's original invitation to attend Dubourg's funeral is in the American Philosophical Society.

to my night's rest of one or two hours of the most pleasing sleep that can be imagined. I find no ill consequences whatever resulting from it, and that at least it does not injure my health, if it does not in fact contribute much to its preservation. I shall therefore call it for the future a *bracing* or *tonic* Bath.

B. Franklin.

To his "Dear Polley" he wrote on that topic on which apparently he devoted so much thought—catching cold.

Tuesday Morning, June 27, 1769.

To Miss Mary Stevenson.

. . . I take this Opportunity to send you also, a late Paper, containing a melancholy Account of the Distresses of some Seamen. You will observe in it the Advantages they receiv'd from wearing their Clothes constantly wet with Salt Water, under the Total Want of fresh Water to drink. You may remember I recommended this practice many years ago. Do you know Dr. Len, and did you communicate it to him? I fancy his Name is wrong spelt in this Paper, and that it should be Lind,[1] having seen in the Review some Extracts from a book on Sea-Diseases, published within these 2 or 3 Years, by one Dr. Lind; but I have not seen the Book, and know not whether such a Passage be in it.

I need not point out to you an Observation in favour of our Doctrine, that you will make on reading this Paper, that, having little to eat, these People in wet Clothes Day and Night caught no Cold.

My respects to your Aunt, and love to all that love you.

Yours Affectionately, B. Franklin.

A wise observation is found below:

London, September 7, 1769.

To Cadwallader Evans.

. . . Our friend W. . . . who is always complaining of a constant fever, looks nevertheless fresh and jolly, and does not fall

[1] James Lind (1716-1794), author of "An essay on diseases incidental to Europeans in hot climates, with the method of preventing their fatal consequences; to which is added an appendix concerning intermittent fevers; to the whole is annexed a simple and easy way to render salt water fresh and to prevent a scarcity of provisions in long voyages." London, 1768. 2nd ed. in 1771.

away in the least. He was saying the other day at Richmond, (where we were together dining with Governor Pownall), that he had been pestered with a fever almost continually for these three years past, and that it gave way to no medicines, all he had taken, advised by different physicians, having never any effects towards removing it. On which I asked him, if it was not now time to inquire, whether he had really any fever at all. He is indeed the only instance I ever knew of a man's growing fat upon a fever.

CHAPTER IV

1770–1779

MANY references can be found to the gout, from which Franklin suffered severly, but the following note on the behaviour of this disease, proves how closely he watched its varying course and that he was aware of the peculiar shifting of the symptoms which at times occur in this malady.

London, June 10, 1770.

To Mrs. Deborah Franklin.

. . . As to myself, I had from Christmas till Easter, a disagreeable Giddiness hanging about me, which however did not hinder me from being about and doing Business. In the Easter Holidays being at a Friend's House in the Country, I was taken with a sore Throat, and came home half strangled. From Monday till Friday, I could swallow nothing but Barley Water and the like. I was bled largely, and purged two or three times. On Friday came on a Fit of the Gout, from which I had been free Five Years. Immediately the inflammation and Swelling in my Throat disappeared; my Foot swelled greatly, and I was confined about three Weeks; since which I am perfectly well, the Giddiness and every other disagreeable Symptom having quite left me. I hope your Health is likewise by this time quite re-established, being as ever, my dear child, your affectionate Husband,

B. Franklin.

London, Jan. 28, 1772.

To Anthony Tissington.

. . . Mrs. Stevenson keeps about, but is ever ailing, like your Dame, with Rheumatic Pains that fly from Limb to Limb continually. Tis a most wicked Distemper, and often puts me in mind of the Saying of a Scotch Divine to some of his Brethren who where complaining that their Flocks had of late been infected with *Arianism* and *Socinianism*. "Mine," says he, "is infected with a worse *ism* than either of those."

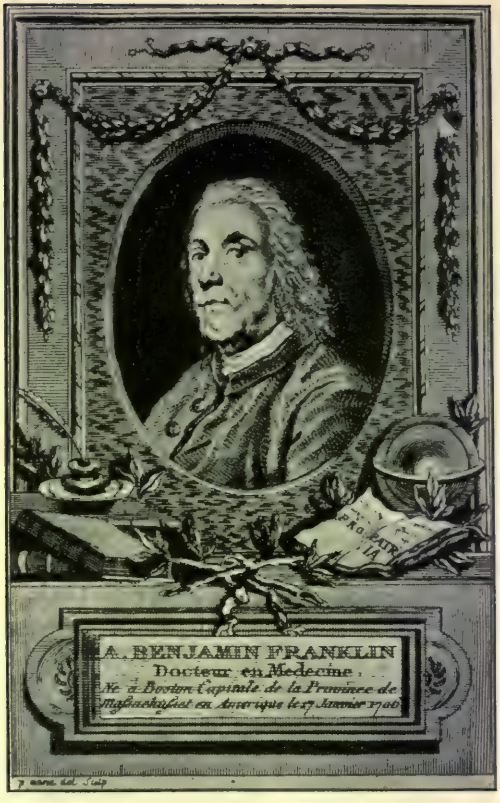

A. BENJAMIN FRANKLIN
Docteur en Medecine.
Ne a Boston Capitale de la Province de
Massachusset en Amerique le 17 Janvier 1706

FIG. 17.—Benjamin Franklin, Docteur en Médecine. From a rare engraving by P. Maren, in the author's collection.

. . . Pray, Brother, what can that be? . . . It is, the *Rheumatism.*" . . .

Dr. Thomas Bond wrote the following interesting letter, and Dr. Franklin answered it in full, giving his personal views on the subject of Medical Education.

Philadelphia, July 6, 1771.

Dear Sir:

This will be delivered to you by Mr. Daniel Kheun, the Brother of Doct. Kheun, Professor of Materia Medica and Botany in our College. He is going to Sweeden to study Divinity and proposes returning here with the pastoral charge of some of the Swedish Congregations. His Brother thinks Doctr Franklin's patronage will be of particular Service to him in his Designs and both he and I shall think ourselves much obliged for your Civilities to him.

My Second Son Richard is studying Physic and Surgery with such Application his Friends have Expectations of his making a Figure in the different Branches of his Profession, especially the latter. He is to be examined in our Colledge next year, and is then to finish his Studies in Europe. But where to send him to the greatest Advantage, is with Me a Doubt. Most of our young Men have depended on Edenbourgh and London for their Education. The School of Edinburgh seems at this time to be better calculated to please the Fancy, than to form the Judgement; and indeed the many extraordinary Novelities incullcated there, would be a Barr to public Confidence in this Part of the World. As far as We can judge from the public Exhibitions, Surgery in London is a *mere mechanic* Art, well executed. The Academy of Surgery in Paris, aims at uniting Science to their Profession and have done thereby Honour to it. But whether they have men of Eminence in their Hospitals and Theatres of Anatomy I know not. My friends Astruc, Winslow, Ferin, Huno, and Le Cat are dead. From the character and Writings of Gaubius, there is reason to Think Physick is scientifically and usefully taught in Leyden, and yet it is said that School is neglected. Vanswieten has aimed at a Reform of the medical Institutions in Vienna, and yet the World is annually misled by Absurdities and Falsehoods under his Sanction. Who, that has tryed the Cicuta, can read the Account given of it without a Blush. The Uva

Ursi has indeed the Appearance of being a safe and useable Addition to the Materia Medica. This we will give them the credit for. Thus my dear Friend, you see the Difficulties I am under, in an Affair I have much at Heart and which it is in your Power to remove. Every man who is acquainted with the Writings of Sir John Pringle must wish to see Physick cultivated on his Principles, and would be much pleased with his Advice in a medical Education. If therefore you could, at some Liesoure Hour, collect his Sentiment on this Occasion, and communicate it to me, it would be the highest Satisfaction. Oh! what Pleasure it would give Me to have the Portrait of that medical Sage at your right Hand.

Good Mrs. Franklin has presented Me with a new Picture of You which has been much visited, and much admired, it is generally agreed there is in it a remarkable sensible meaning, added to a most striking Likeness. I most sincerely thank you for this additional Instance of your Friendship. On the 28th of June We had a Commencement in the Colledge, the Farce was prettily played off. I have sent you one of the medical Dissertations Dedicated to yourself and the Governour; the Author is really a Man of Merit. There is another on a Dropsy, which mentions the extraordinary Success of my Method in the Cure of Dropsies in the Pennsylvania Hospital, which I would Gladly have sent to Sir John, but the Facts are there so badly chosen, and the Principles so much mistaken, that I cannot patronise it. This will lay me under the disagreeable Necessity of revising my Notes on that Subject.

Our Philosophical Society continues, tho few Papers have been sent to it since the Publication; a Correspondence with the learned Societies in Europe would be usefull and reputable and probably a Spur to us. This I hope you will keep in View, whereby you will greatly oblige all the members and particularly Dear Sir

Your most affectionate
humble servant Th. Bond.

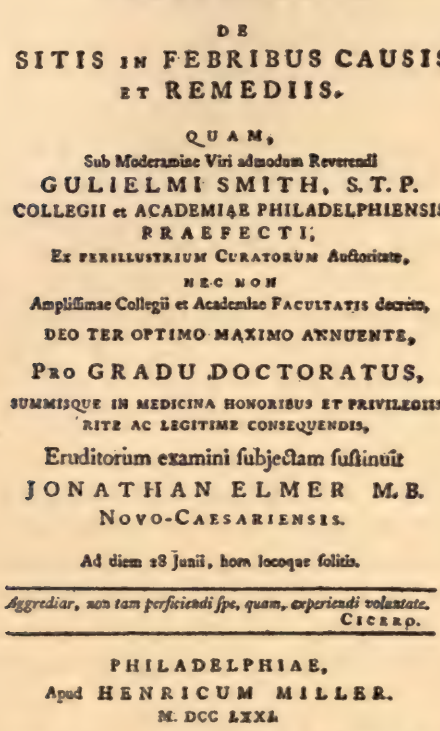
London, Feb. 5, 1772

To Dr. Thomas Bond,

Dear Sir:

I received your Favour by Mr. D. Kuhn but being then just setting out on a Tour thro' Ireland and Scotland, I had not time to answer

it. Mr. Kuhn I believe went directly to Sweden. I shall, if he returns hither while I am here, gladly render him any Service in my Power.



DISSERTATIO MEDICA,
INAUGURALIS,

DE

SITIS IN FEBRIBUS CAUSIS
ET REMEDIIS.

QUAM,

Sub Moderamine Viri admodum Reverendi
GULIELMI SMITH, S. T. P.
COLLEGII et ACADEMIÆ PHILADELPHIENSIS
PRAEFECTI;
Ex perillustrium Curatorum Auctoritate,
NEC NON
Amplissimæ Collegii et Academiæ Facultatis decreto,
DEO TER OPTIMO MAXIMO ANNUENTE,

Pro GRADU DOCTORATUS,

SUMMISQUE IN MEDICINA HONORIBUS ET PRIVILEGIIS
RITE AC LEGITIME CONSEQUENDIS,

Eruditorum examini subjectam sustinuit
JONATHAN ELMER M. B.
Novo-Caesariensis.

Ad diem 28 Junii, horis locoque solitis.

Aggrediar, non tam perficiendi spe, quam, experiendi voluntate.
CICERO.

PHILADELPHIAE,
Apud HENRICUM MILLER.
M. DCC LXXX.

Fig. 18.—Title Page of Dr. Jonathan Elmer's Thesis, which was dedicated to Franklin. The original in the author's library.

I suppose your Son Richard will spend some time in London, where by what I have heard, Physic and Surgery may be studied to as great advantage as in any Part of the World, by Attending the Anatomical Lectures and Hospitals, conversing with the most eminent Practitioners, and Reading under their Advice and Direction; and yet the general Run is at present to Edinburgh; there being at the Opening of the Schools when I was there in November last, a much greater Number of medical Students than had ever been known before. They have indeed a Set of Able Professors in the several Branches, if common

Opinion may be rely'd on. I who am no Judge in that Science, can only say that I found them very sensible Men, and agreeable Companions, I will endeavour to obtain Sir John Pringle's Advice in the Affair, as you desire. Every Wednesday Evening he admits young Physicians and Surgeons to a Conversation at his House, which is thought very improving to them. I will endeavour to introduce your Son there when he comes to London. And to tell you frankly my Opinion, I suspect there is more valuable knowledge in Physic to be learnt from the honest candid Observations of an old Practitioner, who is past all desire of more Business, having made his Fortune, who has none of the Professional Interest in keeping up a Parade of Science to draw Pupils, and who by Experience has discovered the Inefficacy of most Remedies and Modes of Practice, than from all the formal Lectures of all the Universities upon Earth. I like therefore a Physician's breeding his Son to Medicine, and wish the Art to be continued with the Race, as thinking that must be upon the whole most for the Publick Welfare. . . .

. . . I thank you for the inaugural Dissertation, and am pleas'd to see our School of Physic begin to make a Figure. I know not why it should not soon be equal to that in Edinburgh. I am much oblig'd to the young gentleman who has done me the Honour to inscribe his Performance to me. I wish him the Success his Ingenuity seems to Promise him.[1] . . .

In 1768 three years before Franklin visited Edinburgh, the Faculty of the Medical Department of the University of Edinburgh was composed of:

Alexander Monro, M.D., Professor of Anatomy and Surgery.
William Cullen, M.D., Professor of Institutes of Medicine.
John Gregory, M.D.,[2] Professor of Practice of Medicine.

[1] Jonathan Elmer who was one of the ten members of the first class to graduate with the degree of Bachelor of Medicine in 1768 from the College and Academy of Philadelphia, now the University of Pennsylvania. He was also one of the four who returned in 1771 and received in addition the degree of Doctor of Medicine. To receive this degree of M.D. a thesis was necessary. Elmer's thesis is the only one of the four dedicated to Benjamin Franklin.

[2] John Gregory, 1724-1773. Celebrated Scottish physician. Professor of Medicine at Aberdeen and later of the Practice of Physic in Edinburgh.

Fig. 19.—Dr. William Cullen. Engraved by Ridley.

Fig. 20.—John Gregory, M.D., F.R.S.

Joseph Black, M.D., Professor of Chemistry.
Thomas Young, M.D., Professor of Midwifery.
Francis Home, M.D., Professor of Materia Medica.
John Hope, M.D.,[1] Professor of Botany.
John Rae, M.D., Lecturer on Surgery in the Infirmary.

London, Jan. 30, 1772.

To William Franklin.

. . . In Scotland I spent 5 Days with Lord Kames at his seat, Blair Drummond, near Stirling, two or three Days at Glasgow, two Days at Carron Iron Works, and the rest of the Month in and about Edinburgh, lodging at David Hume's, who entertain'd me with the greatest Kindness and Hospitality, as did Lord Kames and his Lady. All our old acquaintances there, Sir Alex[r] Dick and Lady, Mr. McGowen, Drs. Robertson, Cullen, Black, Ferguson, Russel, and others, enquired affectionately of your Welfare. . . .

An important medical letter, in the possession of Dr. S. Weir Mitchell, containing useful suggestions is the following:

London, May 8, 1772.

To Dr. John Hawkesworth:[2]

Dear Sir:

Dining abroad yesterday, and not coming home till 12 at night I did not get your letter in time to answer it by the return of the post as you desired.

Dr. McBride, of Dublin, some time since discovered that putrid flesh could not only be rendered sweet, but its firmness restored by immersing it in Fix'd Air; which is air that has made part of the solid substance of bodies, and is separated and set at liberty from them in their dissolution, or fermentation, or effervescence with other bodies. This air is not fit for breathing; flame is extinguished by it; and, taken into the lungs it instantly extinguishes animal life, but taken into the stomach is deemed

[1] John Hope, 1725-1786. Scottish physician and botanist. In 1762 Franklin wrote Sir Alexander Dick saying, "Please to acquaint your friend Dr. Hope that I am about returning to America this summer, and will send him free of charge for postage in America any Letters containing Leaves of Plants or small Parcells of Seeds that shall be committed to my care by any of his or your Friends there."

[2] John Hawkesworth, LL.D., 1715-1773. Writer and editor of Swift.

salutary, as in Pyrmont water which contains much of it. Dr. Priestley discovered that two-fourths of the air, one produced by suffering dead mice to putrefy under glass, the other by the effervescence of chalk and water with a small quantity of acid or vitriol, in either of which airs living mice being put would instantly die, yet the two being mixed both become good common air, and mice breathe in it freely. From his own and Dr. McBride's experiment (who thought Fix'd Air would prevent or cure the sea scurvy) he was persuaded it might be of use in mortification. But of this there has been only a single experiment. A Physician of his acquaintance at Leeds wrote to him while he was lately in town that a person dying as was thought of a putrid fever with all the symptoms of a mortification in the bowels had been suddenly relieved and recovered by the injection of Fix'd Air as a clyster. These are all our present premises upon which you can judge as well as I how far one may expect the same Fix'd Air will be of service applied to a cancer, but, as you ask my opinion, as the case might be otherwise desperate and we know of no danger in the trial, I should be for trying it. I would first syringe the sore strongly with warm water impregnated with Fix'd Air so as to cleanse well the part. Then I would apply to it a succession of glasses filled with Fix'd Air, each glass to remain till the sore had absorbed the Fix'd Air contained in it. It would require a long description to explain the readiest methods of obtaining the air, applying it, and impregnating the water with it, and perhaps I would not make myself clearly understood. The best way is to show it which I will do either here or at Bromley if you desire it.

Being ever my dear friend

Yours most affectionately,

B. Franklin.

From the following he might be almost called a therapeutic nihilist.

London, Aug. 19, 1772.

To William Franklin.

In yours of May 14th, you acquaint me with your indisposition, which gave me great concern. The resolution you have taken to use more exercise is extremely proper, and I hope you will steadily perform it.

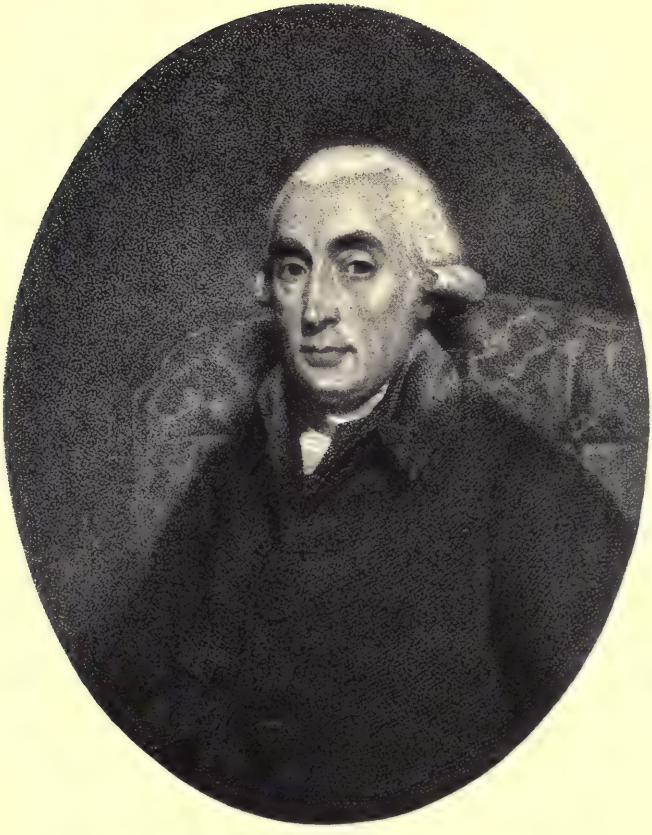


Fig. 21.—Dr. Joseph Black. Engraved by J. Posselwhite, after a portrait by Raeburn.

Joseph Black, 1728-1799. Celebrated Scottish Chemist. Professor of Chemistry at Glasgow and later at Edinburgh. Made important discoveries on the nature of lime and carbonic acid gas. Originated the theory of latent heat.

It is of the greatest importance to prevent diseases, since the cure of them by physic is so very precarious. . . .

. . . The dumb bell is another exercise of the latter compendious kind. By the use of it I have in Forty swings quickened my pulse from sixty to one hundred beats in a minute, counted by a second watch, and I suppose the warmth generally increases with quickness of pulse. . . .

A long letter to Dr. Dubourg, with whom he frequently corresponded, is devoted entirely to swimming, an exercise Franklin was very fond of and in which he was expert.

To Barbeu Dubourg.

. . . During the great heats of summer there is no danger in bathing, however warm we may be, in rivers which have been thoroughly warmed by the sun. But to throw one's self into cold spring water, when the body has been heated by exercise in the sun, is an imprudence which may prove fatal. I once knew an instance of four young men, who having worked at harvest in the heat of the day, with a view of refreshing themselves, plunged into a spring of cold water; two died upon the spot, a third the next morning, and the fourth recovered with great difficulty. A copious draught of cold water, in similar circumstances, is frequently attended with the same effect in North America.

The exercise of swimming is one of the most healthy and agreeable in the world. After having swam for an hour or two in the evening, one sleeps cooly the whole night, even during the most ardent heat of summer. Perhaps, the pores being cleansed, the insensible perspiration increases and occasions this coolness. It is certain that much swimming is the means of stopping a diarrhœa, and even of producing a constipation. With respect to those, who do not know how to swim, or who are affected with a diarrhœa at a season which does not permit them to use that exercise, a warm bath, by cleansing and purifying the skin, is found very salutary, and often effects a radical cure. I speak from my own experience, frequently repeated, and that of others to whom I have recommended this.

London, Feb. 10, 1773.

To James Johnston.

Sir:

I have received your Letter with the Sample of North American Senna, which I put into the Hands of a Friend who is a great Botanist as well as a Physician, and has made some Trial of it.

We have seen how medical men were largely instrumental in electing Franklin to the Royal Society and therefore it is gratifying to see that he returned the compliment.

London, Feb. 14, 1773.

To Joseph Galloway.

. . . I thank you for proposing the two Members I mention'd. I have now some others to propose, viz: Dr. Barbeu Dubourg of Paris, a Man of very extensive Learning and an excellent Philosopher, who is ambitious of the Honour. . . .

. . . There is another Gentleman, who, I believe, would be pleas'd with it, tho' he has not mentioned it; I mean the President of the Royal Society, Sir John Pringle, Bart. It is usual for the Academy of Sciences at Paris always to chuse the president of the English Royal Society one of their Foreign Members, and it is well taken here as a Mark of Respect, and I think it would also be taken by the Society if you should chuse him. . . .

Doubourg was elected; Pringle was not.

The following pieces are all from letters to his friend Barbeu Dubourg.

I shall not attempt to explain why damp clothes occasion colds, rather than wet ones, because I doubt the fact; I imagine that neither the one nor the other contribute to this effect, and that the cause of colds are totally independent of wet and even of cold. I propose writing a short paper on this subject, the first moment of leisure I have at my disposal. In the mean time I can only say, that, having some suspicions that the common notion, which attributes to cold the property of stopping the pores and obstructing perspiration, was ill founded, I engaged a

young physician, who is making some experiments with Sanctorius's balance, to estimate the different proportions of his perspiration, when remaining one hour quite naked, and another warmly clothed.[1] He pursued the experiment in this alternate manner for eight hours successively and found his perspiration almost doubled during those hours in which he was naked.

Your observations on the causes of death, and the experiments which you propose for the recalling to life those who appear to be killed by lightning, demonstrate equally your sagacity and your humanity. It appears that the doctrines of life and death in general are yet but little understood.

A toad buried in sand will live, it is said, till the sand becomes petrified, and then being enclosed in the stone, it may still live for we know not how many ages. The facts which are cited in support of this opinion are too numerous and too circumstantial, not to deserve a certain degree of credit. . . .

. . . I have seen an instance of common flies preserved in a manner somewhat similar. They had been drowned in Madeira wine, apparently about the time it was bottled in Virginia, to be sent hither (to London). At the opening of one of the bottles, at the house of a friend where I then was, three drowned flies fell into the first glass that was filled. Having heard it remarked that drowned flies were capable of being revived by the rays of the sun, I proposed making the experiment upon these; they were therefore exposed to the sun upon a sieve, which had been employed to strain them out of the wine. In less than three hours, two of them began by degrees to recover life. They commenced by some convulsive motions of the thighs, and at length they raised themselves upon their legs, wiped their eyes with their fore feet, beat and brushed their wings with their hind feet, and soon after began to fly, finding themselves in Old England, without knowing how they came thither. The third continued lifeless till sunset, when, losing all hopes of him, he was thrown away.

I wish it were possible, from this instance, to invent a method of embalming drowned persons, in such a manner that they may be recalled

[1] From the letter on page 40 it will be seen that this experiment was not entirely original with Franklin, he having read of a somewhat similar one some years before. The "young physician" was Dr. William Stark, 1740-1770.

to life at any period, however distant; for having a very ardent desire to see and observe the state of America a hundred years hence, I should prefer to any ordinary death, the being immersed in a cask of Madeira wine, with a few friends, till that time, to be then recalled to life by the solar warmth of my dear country! But since in all probability we live in an age too early and too near the infancy of science, to hope to see an art brought in our time to its perfection, I must for the present content myself with the treat, which you are so kind as to promise me, of the resurrection of a fowl or a turkey cock.

I am, etc.,
B. Franklin.

. . . The flesh of animals, fresh killed in the usual manner, is firm, hard, and not in a very eatable state, because the particles adhere too forcibly to each other. At a certain period, the cohesion is weakened, and, in its progress towards putrefaction, which tends to produce a total separation, the flesh becomes what we call tender, or is in that state most proper to be used as our food.

It has frequently been remarked, that animals killed by lightning putrefy immediately. This cannot be invariably the case, since a quantity of lightning, sufficient to kill, may not be sufficient to tear and divide the fibres and particles of flesh, and reduce them to that tender state, which is the prelude to putrefaction. Hence it is, that some animals killed in this manner will keep longer than others. But the putrefaction sometimes proceeds with surprising celerity. . . .

. . . The young physician, whom I mentioned is dead, and all the notes which he had left of his curious experiments are by some accident lost between our friends Sir John Pringle and Dr. Huck (Saunders);[1] but these gentlemen, if the papers cannot be recovered, it is to be presumed, will repeat the experiments themselves.

B. Franklin.

The following two letters were on special hobbies of Franklin's, fresh air and catching cold.

[1] Richard Huck (Saunders), 1720-1785. Physician to the British Army in America, under Lord Loundoun, during the Seven Years' War. His name originally was Huck, but marrying the niece and heiress of Admiral Sir Charles Saunders, he added that name to his own.

London, June 22, 1773.

To Jean Baptiste Le Roy.[1]

. . . I am pleas'd to hear you are engag'd in the Consideration of Hospitals. I wish any Observations of mine could be of Use to you, they should be at your Service. But 'tis a Subject I am very little acquainted with. I can only say, that, if a free and copious Perspiration is of Use in Diseases, that seems, from the Experiments I mention'd to M. Dubourg to be best obtained by light covering and fresh Air continually changing. The Moisture on the Skin when the Body is warmly covered, being a Deception, and the Effect not of greater Transpiration, but of the Saturation of the Air included under and in the Bedclothes, which therefore can absorb no more, and so leaves it on the surface of the Body. From those Experiments I am convinc'd of what I indeed before suspected, that the Opinion of Perspiration being check'd by Cold is an Error, as well as that of Rheum being occasion'd by Cold. But as this is Heresy here, and perhaps may be so with you, I only whisper it, and expect you will keep my Secret. Our Physicians have begun to discover that fresh Air is good for People in the Small-Pox and other Fevers. I hope in time they will find out that it does no harm to People in Health.

We have nothing new here in the philosophic Way. I shall like to hear how M. Lavoisier's Doctrine supports itself as I suppose it will be controverted.

With the greatest Esteem, I am ever, Dear Sir,
Yours most affectionately,
B. Franklin.

London, June 29, 1773

To Barbeu Dubourg.

Dear Friend,

. . . I have not time to write what I intend upon the Cause of Colds, or Rheums, and my opinion on that Head are so singular here that I am almost afraid to hazard them abroad. In the mean time, be so kind as to tell me at your leisure, whether in France, you have a general Belief that moist Air, and cold Air, and damp Shirts or Sheets, and wet

[1] Jean Baptiste LeRoy, 1724-1800. A natural philosopher, born in Paris. Member of the Academie des Sciences, of the Royal Society, and of the American Philosophical Society. He wrote several works on electricity.

Floors, and Beds that have not lately been used, and Clothes that have not been lately worn, and going out of a warm Room into the Air, and leaving off a long-worn Waistcoat, and wearing leaky Shoes, and sitting near an open Window, or Door, in a coach with both Glasses down, are all or any of them capable of giving the Distemper we call *a cold*, and you *a Rheum*, or *Catarrh?* Or are these merely *English* ideas? . . .

I am ever, with the greatest Esteem and Respect,

Dear Sir, yours, etc.

B. Franklin.

It is to be regretted that Franklin never wrote his intended paper on catching cold, the following long list of headings or preparatory notes and hints as he called them, gives us a very clear idea of what the paper would have contained. This is the nearest approach to a real medical article among Franklin's writings, but it shows what he could have done.

Preparatory Notes and Hints for Writing a Paper Concerning what is Called Catching Cold.

Definition of a Cold.

It is a Siziness and thickness of the Blood, whereby the smaller Vessels are obstructed, and the Perspirable Matter retained, which being retained offends both by its Quantity and Quality; by Quantity, as it overfills the Vessels, and by the Quality; as part of it is acrid, and being retained, produces Coughs and Sneezes by Irritation.

How this siziness is Produc'd.

1. By being long expos'd in a cold Air, without Exercises; cold thickens Glew.

2. By a diminish'd Perspiration, either 1, from breathing and living in moist Air, or, 2, from a clogging of the Pores by clammy Sweat dry'd on and fastning down the Scales of the Skin; or, 3, by Cold constringing the Pores partially or totally, sleeping or waking; or, 4, by having eat foods of too gross Particles for free Persp^{n}., as Oysters, Pork, Ducks, etc. People are found frequently costive after much bathing.

3. By Repletion, as when more is thrown into the Habit by Eating and Drinking than common Persp^{n}. is capable of discharging in due time; whence the Vessels are distended beyond their Spring, and the quantity of contained Fluid, that should be briskly moved to preserve

or acquire due Thinness, is too weighty for their Force, whence a slow Motion—then viscidity. This Repletion is increased by a Constipation of the Belly happening at the same time. In an approaching cold, more water is made than usual.

By cooling suddenly in the Air after Exercise. Exercise quickening the Circulation, produces more perspirable Matter in a given time, than is produced in rest. And tho' more is likewise usually discharg'd during Exercise, yet on sudden quitting of Exercise and standing in the Air, the Circulation and Production of Perspirable matter still continuing some time, the over Quantity is retain'd. It is safer not to go into water too cold.

4. By particular Effluvia in the Air, from some unknown Cause. General Colds thro'-out a Country. By being in a Coach close, or small Room with a Person having a Cold.

5. By Relaxation of the Solids, from a warm and moist Air, so that they are too weak to give due Motion to the Fluids.

Of partial Colds affecting parts only of the Body.

Causes of Feverishness attending Colds.

Ill Consequences often attending Colds, as Pleurisies, Consumptions, etc. Some never take cold, some frequently; causes of the Difference.

Present Remedies for a Cold should be warming, diluting, bracing.

Means of preventing Colds: Temperance, Choice of Meats and Drinks, warm Rooms, and Lodging, and Clothing in Winter, dry Air, Care to keep the Belly open, and frequent discharge of Water, warm Bathing to cleanse the Skin, rubbing after Sweat, especially in the Spring.

Difficulties that first put me on thinking on this Subject. People get cold by less, and not by more, viz.

By putting on a damp Shirt on a dry Body, Yes.

By putting on a dry Shirt on a wet Body, tho' this wets the shirt ten times more, No.

By sitting in a Room, where the Floor has been newly wash'd, Yes.

By going into a River, and staying there an Hour (no Sheets so wet), No.

By wetting the feet only, Yes.

By wetting all the Clothes thro' to the Body, and wearing them a whole day. No.

By sitting in a Room against a Crevice, Yes.

By sitting as long in the open Air, No.

Few of these Causes take place if the Vessels are kept Empty.

Reapers in Pennsylvania:—

Drinking cold Water when they are hot.

If it makes them sweat, they are safe.

If not, they fall ill, and some die.

People hot, should drink by Spoonfuls, the Reason.

Taking Cold. The Disorder only called so in English, and in no other Language.

American Indians, in the Woods, and the Whites in Imitation of them, lie with their Feet to the Fire in frosty Nights, on the ground and *take no cold* while they can keep their Feet warm.

Feet and Hands are apt to be Cold in that Disorder, and why. Is it the Siziness, or the greater Evaporation?

Hottentots grease themselves—occasions other Evacuations more plentiful. Greasing keeps the body warm. Bad to hold Water too long. Parts colder when first unclothed than afterwards, why?

It was a disgrace among the ancient Persians to cough or spit.

Probably as it argued Intemperance.

Vessels when too full, leak. Quicksilver thro' leather. Thin Fluid leaked evaporates. Corners of eyes, etc. Sizy will not all evaporate. What is left corrupts. Hence Consumptions. Hectic Fevers, from Absorption of Putrid pus. It ferments the Blood like Yeast.

People seldom get Cold at Sea, tho' they sleep in Wet Clothes. Constant Exercise. Moderate Living. Bad Cooks. Yet Air is very moist. Wet Floors. Sea surrounding, etc.

Exercise cures a cold. Bishop Williams riding several Miles from London, or Exeter, to Salisbury.

Bark good for a Cold, taken Early.

Particular Parts more accustomed to discharge the irritating persp. matter, as under the Arms in some, Feet in others, etc.

Exp^{t}. of two Rasers.

Every Pain or Disorder now ascrib'd to a Cold.

It is the Covering Excuse of all Intemperance.

Numbers of People in a close Room, and exercising there, fill the air with putrid Particles.

People kill'd by House of Commons, breathing the air thro' Holes in Ceiling.

Think they get Cold by coming *out* of such hot rooms; they get them by being *in*.

Those that live in hotter Rooms (stoves) get no Colds.

Germans and all the northern people.

Alderman and Turtle.

People remark, they were very well before a Cold and eat hearty. Wonder how they catch'd it.

Signs of Temperance.

Mouth not clamy after Sleep.

Saliva thin and watery.

Eyelids not stuck together with hard Glue.

Voice clear.

No Flegm to raise.

Advice for Mode of general Temperance without appearing too singular.

Supper not bad after preparatory light Dinner.

May be rectify'd by slight Breakfast next Morning.

He must be too full that one excess will much disorder.

Time of Great Meal mended of late.

One hour variation of compass in 20 years.

After Dinner not fit for Business.

People from the Country get Cold when they come to London, and why? Full Living with moist Air. London air generally moist, why. Much putrid air in London. Silver, etc.

Cooks and Doctors should change Maxims.

Common sense more common among the common Scotch.

Those who do not compare, cannot conceive the Difference between themselves and themselves in full or spare living

Wet Newspapers, why give Colds?

Old Libraries, and damp old Books.

Putrid Animal Matter in Paper Size.

Courts should not sit after Dinner.

Juries fast, a good inst.

Chess—Impatience of Deliberation because more difficult. Writing, etc.

Most Follies arise from Full feeding. Reasons *pro* and *con* not all present.

Temperate Nations wisest.

Dining entertainments bad.

Rem. of Barbarism,—Expensive.

Full Feeding of Children Stupefies.

Fasting Strengthens Reason rather than subdues Passion.

People often do not get Cold when they think they do, and do when they think they do not.

Causes of Colds are primary and secondary.

Colds are of different kinds, putrid and plethoric.

Scarce any Air abroad so unwholesome as Air in a close room often breath'd.

Warm Air dissolves more Moisture than Cold.

In hot Countries men wrap themselves in wet Sheets to sleep.

A general Service to redeem People from the slavish Fear of getting cold, by showing them where the Danger is not, and that where it is, 'tis in their Power to avoid it.

Surfeit, an Expression formerly us'd, now laid aside.

Costiveness occasioning Colds, how to be prevented.

Colds formerly called Rheums and Catarrhs.

Particular Foods said to engender Rheums.

Query. Is Mr. Wood more or less subject to catch cold since he betook himself to his low diet?

Answer (by Mr. Wood). He now finds himself much more healthy, and much less liable to catch cold. What few colds he now catches are so very slight, that he is not sensible of them, but from the urine, which is then not so clear

I caused the above question to be asked Mr. Wood, and obtained the answer. It is the Mr. Wood who lives upon a pound of flour in a pudding.

B. Franklin.

Dampier, speaking of the Customs of the People at Mindanoo (p. 330), says, "You see abundance of People in the River from Morning 'till night washing their Bodies or Clothes; they strip and stand naked till they have done; then put them on and march out again."

Dr. Gregory says: "All that Class of Diseases which arise from

FIG. 22.—Sir William Watson, M.D., 1715-1787. An English physician and botanist, awarded the Copley medal for his discoveries in Electricity. Engraved by Thornthwaite, from the portrait by Abbot.

catching cold, is found only among the civilized part of Mankind. An old Roman or an Indian, in the Pursuit of War or Hunting, would plunge into a River whilst in a profuse sweat, without fear, and without danger. The greater care we take to prevent catching cold, by the various contrivances of modern Luxury, the more we become subject to it. We can guard against cold only by rendering superior ourselves to its Influence. There is a striking instance of this in the vigorous constitutions of children who go thinly clad in all seasons and weathers."

The Coats of the Vessels are a kind of Network, which contains the Fluids only when not so press'd as to enlarge the Pores of the Net, or when the Fluids are not so press'd as to break the Cohesion of the Globules or Particles, so as to make them small enough to come through. When the Vessels are full, occasioned by a course of full Living they labour in carrying on the Circulation; their Spring or Power of Contraction and Compressing the Fluids they contain, being overstrain'd is weakened, the Circulation proceeds more slowly, the Fluids thicken and become more gluey, both for want of due churning and because less Heat is produc'd in the body. Such a Body requires more Aid of Clothing and Fire to preserve its warmth.

If a Person in that State of Body walks a Mile or two, or uses any other exercise that warms him, the Fluids are rarefied by the Heat, distend the Vessels still more, and the thinner Parts of the Fluids in tender Places force out thro' the Pores of the Vessels in form of a gluey Water, viz., at the Eyes, within the Nose, and within the Lungs. This in moderate Exercise.

If the Exercise is increas'd it comes through every Pore in the Skin, and is called Sweat.

The more volatile Parts of this extravasated Fluid evaporate, and fly off into the Air. The gluey Part remains, thickens and hardens more or less, as it becomes more or less dry; in the Nose and on the Lungs, where Air is continually coming and going, it soon becomes a Mucous, but can hardly grow dryer because surrounded with moist Parts and supply'd with more Moisture. What oozes out of the Corner of the Eye when shut, as in Sleep, hardens into what is called a kind of Gum, being in fact dry Glue.

This in a Morning almost sticks the Eyelids together.

With some Mucous Matter the Nose is sometimes almost stopped, and must be cleared by strong Blowing.

In the Windpipe and on the Lungs it gathers and is impacted, so as sometimes to induce a continual Coughing and Hawking to discharge it.

If not easily discharg'd, but remaining long adhering to the Lungs, it corrupts and inflames the Parts it is in contact with; even behind the Ears and between the Parts of the Body so constantly in contact, that the Perspirable Matter, Sweat, etc., cannot easily escape from between them: the Skin is inflamed by it, and a partial Putrefaction begins to take place, they corrupt and ulcerate. The Vessels being thus wounded, discharge greater and continual Quantities. Hence Consumption.

Part of the corrupted Matter, absorbed again by the Vessels and mix'd with the Blood, occasions Hectic Fevers.

When the Body has sweated, not from a dissolution of Fluids, but from the Force above mention'd, as the Sweat dries off, some clammy Substance remains in the Pores, which closes many of them, wholly or in part. The subsequent Perspiration is hereby lessened.

The Perspirable Matter consists of Parts approaching to Putrefaction, and therefore destin'd by Nature to be thrown off, that living Bodies might not putrefy, which otherwise, from their Warmth and Moisture, they would be apt to do.

These corrupting Particles, if continually thrown off, the remainder of the Body continues uncorrupt, or approaches no nearer to a state of Putrefaction. Just as in Boiling Water, no greater degree of Heat than the Boiling Heat can be acquir'd because the Particles that grow hotter, as fast as they become so, fly off in Vapour. But if the Vapour could be retain'd, Water might be made much hotter, perhaps red-hot, as Oil may which is not so subject to Evaporation. So if the Perspirable Matter is retain'd it remixes with the blood, and produces first, a slight putrid fever, attending always what we call a Cold, and when retain'd in a great Degree, more mischievous putrid Diseases.

In hot countries, Exercise of the Body with the Heat of the Climate create much of this putrid perspirable Matter, which ought to be discharg'd. A check in those Countries very pernicious; Putrid Malignant Violent Fevers, and speedy Death, the Consequence.

Its Discharge is also check'd another Way besides that of closing the

Pores, viz. by being in an Air already full of it, as in close Rooms concontaining great Numbers of people, Playhouses, Ballrooms, etc.

For Air containing a Quantity of any kind of Vapour, becomes thereby less capable of imbibing more of that Vapour, and finally will take no more of it.

If the Air will not take it off from the Body, it must remain in the Body; and the Perspiration is as effectually stopt and the Perspirable Matter as certainly retain'd as if the Pores were all stopt.

A Lock of Wet Wool contained in a Nutmeg-Grater may dry, parting with its Moisture thro' the Holes of the Grater. But if you stop all those Holes with wax it will never dry. Nor, if expos'd to the Air, will it dry when the Air is as moist as itself. On the contrary, if already dry, and expos'd to moist Air, it would acquire Moisture.

Thus People in Rooms heated by a Multitude of People, find their own Bodies heated; thence the quantity of perspirable Matter is increased that should be discharged, but the Air, not being changed, grows so full of the same Matter, that it will receive no more. So the Body must retain it. The Consequence is, that next Day, perhaps sooner, a slight putrid Fever comes on, with all the Marks of what we call a Cold, and the Disorder is suppos'd to be got by coming out of a warm Room, whereas it was really taken while in that Room.

Putrid Ferments beget their like. Small-pox, Wet rotten Paper, containing Glue. The cold Fever communicable by the Breath to others, etc.

Urine retain'd, occasions Sneezing, etc.

Coughing and Spitting continually, marks of Intemperance.

People eat much more than is necessary.

Proportionable Nourishment and Strength is not drawn from great Eating.

The succeeding Meals force the Preceding thro' half undigested.

Small Meals continue longer in the Body, and are more thoroughly digested.

The Vessels being roomy can bear and receive without hurt, an accidental Excess.

They can concrete more easily.

There is less quantity of corrupting Particles produc'd.

Putrid Fish very bad.

Black Hole in the Indies.

Franklin wrote the following purely medical letter.

London, July 14, 1773.

To Benjamin Rush.[1]

Dear Sir:

I received your favour of May 1st, with the pamphlet, for which I am obliged to you. It is well written. I hope that in time the endeavours of the friends to liberty and humanity will get the better of a practice, that has so long disgraced our nation and religion.[2]

A few days after I received your packet for M. Dubourg, I had an opportunity of forwarding it to him per M. Poissonnière, physician of Paris, who kindly undertook to deliver it. M. Dubourg has been translating my book into French. It is nearly printed, and he tells me he purposes a copy for you.

I shall communicate your judicious remark, relating to the septic quality of the air transpired by patients in putrid diseases, to my friend Dr. Priestley. I hope that after having discovered the benefit of fresh and cool air applied to the sick, people will begin to suspect that possibly it may do no harm to the well. I have not seen Dr. Cullen's book, but am glad to hear that he speaks of catarrhs or colds by contagion. I have been long satisfied from observation, that besides the general colds now termed *influenzas*, (which may possibly spread by contagion, as well as by a particular quality of the air), people often catch cold from one another when shut up together in close rooms, coaches, etc., and when sitting near and conversing so as to breathe in each other's transpiration; the disorder being in a certain state. I think, too, that it

[1] Benjamin Rush, 1745-1813. Graduated from Princeton College in 1760. Studied medicine under Dr. Redman for six years and then went abroad and graduated, in 1768, from the University of Edinburgh, with the degree of Doctor of Medicine. On his return, was appointed Professor of Chemistry in the College of Philadelphia in 1769, and in 1789, Professor of the Theory and Practice of Physic and in 1792, Professor of the Institutes of Medicine and Clinical Medicine. Teaching medicine for fourty-four years to probably about 2250 pupils. In 1776 he was appointed Surgeon-General of the Army for the Middle Department. He was a prolific author, his account of the Yellow Fever being his most celebrated work. Signer of the Declaration of Independence; President of the College of Physicians; Member of the American Philosophical Society.

[2] Benjamin Rush wrote, "An Address to the Inhabitants of the British Settlements in America, upon Slave-Keeping." The second edition, which I have, was published in Philadelphia in 1773.

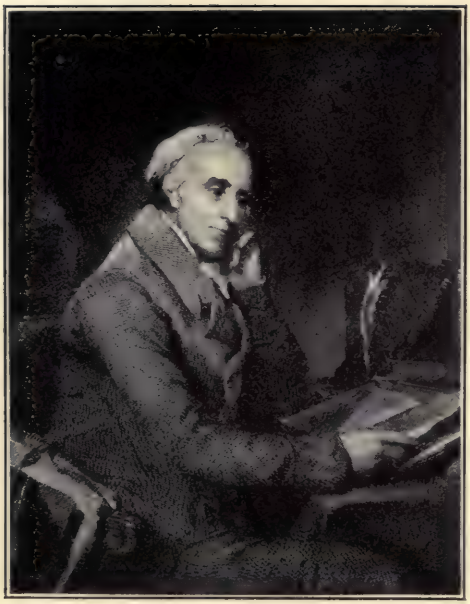


Fig. 23.—Dr. Benjamin Rush. From an engraving by Dodson, after the painting by Sully.

is the frouzy, corrupt air from animal substances, and the perspired matter from our bodies, which being long confined in beds not lately used, and clothes not lately worn, and books long shut up in close rooms, obtains that kind of putridity, which occasions the colds observed upon sleeping in, wearing, and turning over such bedclothes or books, and not their coldness or dampness. From these causes, but more from too full living, with too little exercise, proceed in my opinion most of the disorders which for about one hundred and fifty years past the English have called *colds*.

As to Dr. Cullen's cold or catarrh *a frigore*, I question whether such an one ever existed. Travelling in our severe winters, I have suffered cold sometimes to an extremity only short of freezing, but this did not make me *catch cold*. And, for moisture, I have been in the river every evening two or three hours for a fortnight together, when one would suppose I might imbibe enough of it to *take cold* if humidity could give it; but no such effect ever followed. Boys never get cold by swimming. Nor are people at sea, or who live at Bermudas, or St. Helena, small islands, where the air must be ever moist from the dashing and breaking waves against their rocks on all sides, more subject to colds than those who inhabit part of a continent where the air is driest. Dampness may indeed assist in producing putridity and those miasmata which infect us with the disorder we call a cold; but of itself can never by a little addition of moisture hurt a body filled with watery fluids from head to foot.

With great esteem, and sincere wishes for your welfare, I am, Sir,

Your most obedient humble servant,

B. Franklin.

In the following Franklin reiterates his views on the same subject, that is colds, but adds a little vital statistics.

West Wycomb, the Seat of Lord Le Despencer. Sept. 25, 1773.

To Thomas Percival.[1]

. . . The Difference of Deaths, between 1 in 28 at Manchester, and 1 in 120 at Morton, is surprising. It seems to show the Unwholesomeness of the Manufacturing Life; owing perhaps to the Confinement in small, Close Rooms, or in larger with Numbers, or to Poverty and

[1] Thomas Percival, 1740–1804. A popular English medical and moral writer, practiced in Manchester and was the founder of the Philosophical Society in that city.

want of Necessaries, or to Drinking, or to all of them. Farmers who manufacture in their own Families what they have occasion for and no more, are perhaps the happiest People and the healthiest.

'Tis a curious Remark that Moist Seasons are the healthiest. The Gentry of England are remarkably afraid of Moisture, and of Air. But Seamen, who live in perpetually moist Air, are always Healthy, if they have good Provisions. The Inhabitants of Bermuda, St. Helena, and other Islands far from Continents, surrounded with Rocks against which the Waves continually dashing fill the Air with Spray and Vapor, and where no Wind can arrive that does not pass over much Sea, and of course bring much Moisture. These People are remarkably healthy. And I have long thought that mere moist Air has no ill Effect on the Constitution; tho' Air impregnated with Vapours from putrid Marshes is found pernicious, not from the Moisture, but the Putridity. It seems strange that a Man whose Body is compos'd in great Quantities of Water and Small Beer daily without Inconvenience, should fancy that a little more or less Moisture in the Air should be of such Importance. But we abound in Absurdity and Inconsistency.

Thus, tho' it is generally allowed that *taking the Air* is a good Thing, yet what Caution against Air, what stopping of Crevices, what wrapping up in warm clothes, what shutting the Doors and Windows! even in the midst of Summer! Many London Families go out once a Day to take the Air; three or four Persons in a Coach, one perhaps Sick; these go three or four Miles, or as many Turns in Hide Park, with the Glasses both up close, all breathing over & over again the same Air they brought out of Town with them in the Coach with the least change possible, and render'd worse and worse every moment. And this they call *taking the Air.* From many Years' Observations on myself and others, I am persuaded we are on the wrong Scent in supposing Moist or cold Air the Causes of that Disorder we call a Cold. Some unknown Quality in the Air may perhaps produce Colds as in the *Influenza;* but generally I apprehend they are the Effects of too full Living in proportion to our exercise.

Excuse, if you can, my intruding into your Province, and believe me ever with sincere Esteem, dear Sir,

Your most obedient humble servant,

B. Franklin.

Fig. 24.—Dr. William Hewson. Engraved by H. Robinson from a mezzotint by Vandergucht.

That he suffered occasionally from his enthusiasm for investigating various natural phenomena is here apparent. Probably he had an attack of malaria.

Craven Street, April 10, 1774.

To Joseph Priestley.[1]

. . . I have tried the experiment twice here in England, but without success. The first was in a slow running water with a muddy bottom. The second in a stagnant water at the bottom of a deep ditch. Being some time employed in stirring this water, I ascribed an intermitting fever, which seized me a few days later, to my breathing too much of that foul air, which I stirred up from the bottom, and which I could not avoid while I stooped, endeavoring to kindle it. The discoveries you have lately made, of the manner in which inflammable air is in some cases produced, may throw light on this experiment, and explain its succeeding in some cases, and not in others.

With the highest esteem and respect, I am, dear Sir, your most obedient humble servant,

B. Franklin.

In the following brief paragraph Franklin tells his wife about Dr. William Hewson's[2] illness. His prognosis in this case was wrong as Dr. Hewson died three days later of an infected dissection wound.

[1] Joseph Priestley, 1733–1804. Eminent English philosopher, chemist and theologian. Franklin, who met him in London, encouraged him to write a "History of Electricity." Priestley dedicated his "Description of a New Chart of History" to Franklin.

[2] William Hewson, 1739–1774. His wife, Mary Stevenson, was a great friend of Benjamin Franklin who lodged at her mother's house. It is very likely that Miss Stevenson and Dr. Hewson met through their common friend, Benjamin Franklin. Dr. Hewson studied under William and John Hunter and became an anatomical demonstrator in their school, and later partner with William Hunter. He was elected a Fellow of the Royal Society largely on the recommendation of Dr. Franklin. Awarded the Copley Medal for his work on the lymphatic system in birds, amphibious animals and fishes. He later started a school of his own. He dedicated the second part of his Description of the Lymphatic System in the Human Subject to Benjamin Franklin. Franklin had a print of Dr. Hewson framed in his study. He died in his thirty-fifth year from septic fever, the result of a dissection wound His son, Dr. Thomas Tickell Hewson, was President of the College of Physicians of Philadelphia.

London, April 28, 1774.

To Mrs. Deborah Franklin.

. . . My blessing to the children. Mrs. Hewson's have lately had the small-pox; the eldest in the common way very full, the youngest by inoculation lightly, and both are now well. But Mr. Hewson is down with a terrible fever, and till yesterday, his life was despaired of. We now begin to hope his recovery.

In a letter to Arthur Lee under date, April 3, 1778 written at Passy, Franklin reveals himself as an alienist.

. . . If you do not cure yourself of this Temper it will end in Insanity, of which it is the Symptomatick Forerunner, as I have seen in several Instances. God preserve you from so terrible an Evil; and for his sake pray suffer me to live in quiet. . . .

Many references are to be found among the letters received by Franklin to a cure for dropsy that he was supposed to have discovered. Doctors and others wrote to him from all over Europe asking for particulars. John Stewart, of London, in 1777 writes, for example, as follows:

. . . In one of our newspapers of this week it is asserted that you had recommended the use of tobacco ashes to the physicians at Paris in the cases of ascites, an anasarca, an œdema, and every species of hydropical complaint. That they in consequence had made many experiments and that all of them had been followed by a surprising and speedy cure. What proportion of these ashes goes to a dose and how often to be taken in the twenty-four hours? . . .

Franklin in reply to one of these inquiries wrote to Dr. Daniel Nunez de Tavarez, of Zwolle, Overyssel.

Paris, January 4, 1778.

Sir:

The account given in the newspapers of my having furnished the Physicians with a receipt against the dropsy is a mistake. I know nothing of it, nor did I ever hear before that tobacco ashes had any such virtue.

I thank you for your kind congratulations on our late successes and good wishes for the establishment of our liberty.

I have the honour to be respectfully, Sir,

Your most obedient humble servant,

B. Franklin.

In John Adams' autobiography occurs a very humorous account of how Franklin never allowed a chance, to impress upon all his views on fresh air, escape him. It seems that John Adams and Benjamin Franklin were travelling together in 1776 and the diary reads, "At Brunswick, but one bed could be procured for Dr. Franklin and me, in a chamber little larger than the bed, without a chimney and with only one small window. The window was open, and I who was an invalid and afraid of the air of night, shut it close. 'Oh,' says Franklin, 'don't shut the window, we shall be suffocated.' I answered I was afraid of the evening air. Dr. Franklin replied, 'The air within this chamber will soon be, and indeed is now, worse than that without doors. Come open the window and come to bed, and I will convince you. I believe you are not acquainted with my theory of colds?' Opening the window, and leaping into bed, I said I had read his letters to Dr. Cooper, in which he had advanced, that nobody ever got cold by going into a cold church or any other cold air, but the theory was so little consistent with my experience, that I thought it a paradox. However, I had so much curiosity to hear his reasons that I would run the risk of a cold. The Doctor then began a harangue upon air and cold, and respiration and perspiration, with which I was so much amused that I soon fell asleep, and left him and his philosophy together, but I believe they were equally sound and insensible within a few minutes after me, for the last words I heard were pronounced as if he was more than half asleep. I remember little of the lecture, except that the human body, by respiration and perspiration, destroys a gallon of air in a minute; that two such persons as we were now in that chamber, would consume all the air in it in an hour or two; that by breathing over again the matter thrown off by the lungs and the skin, we should imbibe the real cause of colds, not from abroad, but from within."

According to John Adams, it was the opinion of Franklin's own physician, Dr. Jones, that he fell a sacrifice at last, not to the stone, but

to his own theory, having caught the violent cold which finally choked him, by sitting for some hours at a window with the cold air blowing upon him.

About this time John Hunter wrote the following interesting letter:

"Dr. Hunter's[1] compliments to Dr. Franklin. He has some preparations which he intends giving away and if they would be acceptable to Dr. Franklin, he should be glad to see him any morning (except Tuesday) from 9 to 10 or 11 for a few minutes."

In 1777 Alexander Small wrote Franklin that he would send him a copy of a paper on ventilation of hospitals that he had written, begging Franklin to put the finishing touches to it.

On May 26, 1778, Barbeu Dubourg wrote to Dr. Franklin asking him whether hernia, especially umbilical hernia, was as common in America as in Europe.

Franklin held very advanced and humanitarian views on the question of holding surgeons prisoners of war.

Passy, Sept. 17, 1779.

To John D. Schweighauser.

I should think it would be right to discharge Mr. Hill, the Surgeon. I am sorry he has been kept so long. In my Opinion Surgeons should never be detain'd as Prisoners, as it is their Duty and their Practice to help the sick and wounded of either side when they happen to have an Opportunity. They should therefore be considered not as Parties in any way, but as friends to Humanity.

Dr. Franklin must have been amused by receiving about the same time letters from Benjamin Waterhouse[2] and John Fothergill. On

[1] John Hunter, 1728–1793. Born near Glasgow. Worked a few years with a cabinet maker, then was employed in 1748 in London by his brother, William, as an assistant in his dissecting room. In 1754 became his brother's partner, and lectured regularly. In 1767, elected a Fellow of the Royal Society. Great comparative anatomist, physiologist, and surgeon. Founded a great museum which is said to have cost him £70,000.

[2] Benjamin Waterhouse, 1754–1846. Born in Newport, R. I. He graduated from the University of Leyden in 1780. Studied in London, living in the family of Dr. John Fothergill, and also in Edinburgh. Introduced vaccination into the United States. Vaccinated on July 8, 1800, his son. Sent some threads to Thomas Jefferson who vaccinated all his immediate family and probably himself. Edward Jenner sent him a silver snuff box containing vaccine and a set of lancets. Was elected the first Professor of Theory and Practice of Physic at Harvard in 1782, and occupied that chair for thirty years.

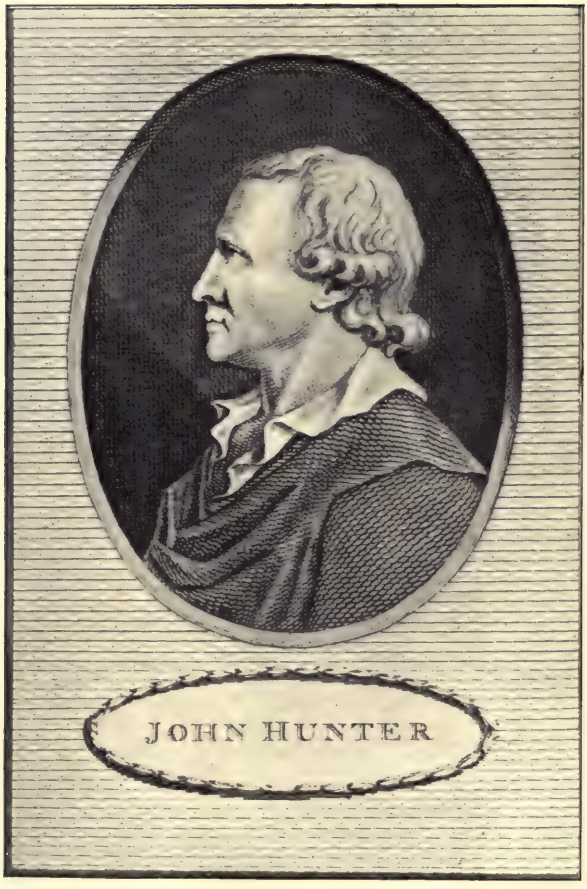


Fig. 25.—Dr. John Hunter.

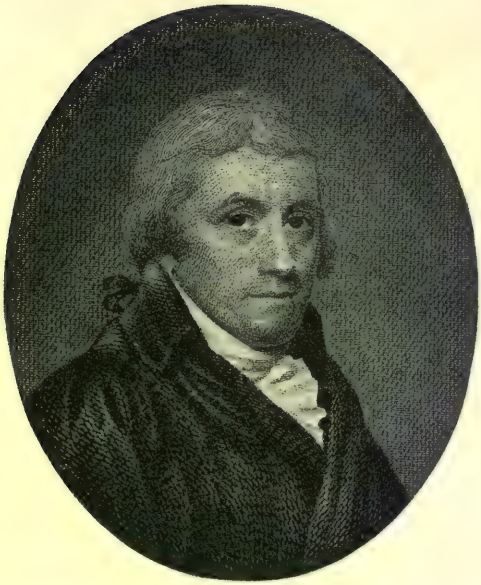


Fig. 26.—Dr. Benjamin Waterhouse. Engraved by R. Reeve.

December 16, 1780, Waterhouse wrote from Leyden saying that he proposed going to Boston to practice and that he believed it not so necessary for men to go to Europe in order to cure the diseases of their next door neighbors. He also says that he learnt many things from Dr. Fothergill during his stay with him and that he had read with interest, the French medical works Dr. Franklin gave him. On December 25, 1780, John Fothergill wrote to Franklin and expressed a hope that his friend and relative, Dr. Waterhouse, would teach in the future Massachusetts College of Medicine; as yet he was too young and inexperienced. Just two years later, Dr. Waterhouse was chosen Professor of Theory and Practice of Physic at Harvard.

CHAPTER V

1780–1790

An interesting observation is found at the end of a letter here quoted. His treatment of the gout reminds one of William Harvey's method of sitting with his legs bare, on the leads of Cockaine-House, or putting them in a pail of cold water.

Passy, July 22, 1780.

To Alexander Small.[1]

. . . You inquired about my gout, and I forgot to acquaint you that I had treated it a little cavalierly in its two last accesses. Finding one night that my foot gave me more pain after it was covered warm in bed, I put it out of bed naked, and perceiving it easier, I let it remain longer than I at first designed, and at length fell asleep leaving it there till morning. The pain did not return, and I grew well. Next winter, having a second attack, I repeated the experiment, not with such immediate success in dismissing the gout, but constantly with the effect of rendering it less painful, so that it permitted me to sleep every night. I should mention, that it was my son who gave me the first intimation of this practice. He being in the old opinion, that the gout was to be drawn out by transpiration, and having heard me say, that perspiration was carried on more copiously when the body was naked, than when clothed, he put his foot out of bed to increase that discharge, and found ease by it, which he thought a confirmation of the doctrine. But this method requires to be confirmed by more experiments, before one can conscientiously recommend it. I give it you, however, in exchange for your receipt of tartar emetic, because the commerce of philosophy as well as other commerce, is best promoted by taking care to make returns. I am ever yours most affectionately,

B. Franklin.

[1] Alexander Small. An English Army Surgeon and a member of the Society of Arts. Author of a paper on Ventilation, read before the French Academy of Sciences.

One of Franklin's "bagatelles," although meant primarily to be humorous, combines as did many of his writings, both wit and meaning. It is well worth perusal, but its length precludes my quoting it in full. In the *New York Medical Journal* of January 2, 1909, Dr. Charles Greene Cumston, in an article entitled Benjamin Franklin from the Medical Viewpoint, gives the whole of this comical dialogue; it may be found as well in the various collected writings of Benjamin Franklin.

Dialogue between Franklin and the Gout.

Midnight, October 22, 1780.

Franklin. Eh! Oh! Eh! What have I done to merit these cruel sufferings?

Gout. Many things; you have ate and drank too freely, and too much indulged those legs of yours in their indolence.

Franklin. Who is it that accuses me?

Gout. It is I, even I, the Gout.

Franklin. What! my enemy in person?

Gout. No, not your enemy.

Franklin. I repeat it; my enemy; for you would not only torment my body to death, but ruin my good name; you reproach me as a glutton and a tippler; now all the world, that knows me, will allow that I am neither the one nor the other.

Gout. The world may think as it pleases, it is always very complaisant to itself, and sometimes to its friends; but I very well know that the quantity of meat and drink proper for a man, who takes a reasonable degree of exercise, would be too much for another, who never takes any. . . .

In the American Philosophical Society collection, there is a letter of Benjamin Franklin's to Mme. Brillon, written about 1781, in which he denies that excessive indulgence in sexual pleasures is the cause of gout, as he had no gout when he was a young man.

Franklin had been elected January 17, 1777, a member of the Royal Medical Society of Paris, and there are many most cordial invitations to be present at meetings from Dr. Vicq d'Azyr, who was the permanent Secretary.

An excellent illustration of how Franklin remembered or kept a record of peculiar or interesting facts, from which he often later drew important deductions, is here found.

Passy, July 20, 1781.

To Felix Vicq d'Azyr.[1]

. . . With respect to the length of time during which the Power of Infection may be continued in dead Bodies, which is considered in that Report, I would mention to you three Facts, which, though not all of equal Importance or weight, yet methinks it may be well to preserve a Memorandum of them, that such Observations may be made when Occasion offers, as are proper to confirm or invalidate them.

While I resided in England I read in a Newspaper that in a Country Village at the Funeral of a Woman whose Husband had died of the Small-Pox 30 years before, and whose Grave was dug so as to place her by his Side, the Neighbors attending the Funeral were offended with the Smell arising out of the Grave, occasioned by a Breach in the Husband's old Coffin, and 25 of them were in a few Days after taken ill with that Distemper, which before was not in that Village or its Neighborhood, nor had been for the Number of (years above mentioned).

About the Years 1763 or 1764, several Physicians of London who had been present from Curiosity at the Dissection of an Egyptian Mummy, were soon after taken ill of a malignant fever, of which they died. Opinions were divided on this Occasion. It was thought by some that the Fever was caused by Infection from the Mummy; in which Case the Disease it died of must have been embalmed as well as the Body. Others who considered the Length of Time; at least 2000 Years, since that Body died, and also that the Embalming must be rather supposed to destroy the Power of Infection, imagined the Illness of these Gentlemen must have had another Original.

About the year 1773, the Captain of a Ship, which had been at the Island of Tenneriffe, brought from thence the dried Body of one of the ancient Inhabitants of that Island, which must have been at least 300 years old, that custom of drying the Dead there having been so long

[1] Felix Vicq d'Azyr, 1748–1794. Physician in ordinary to Marie Antoinette. Eminent as a comparative anatomist and physiologist. Member of the Academy of Sciences. Founder of the Royal Society of Medicine. Member of the French Academy.

discontinued. Two members of the Royal Society went to see that body. They were half an hour in a small close room with it, examining it very particularly. The next Day they were both affected with a singularly violent Cold,[1] attended with uncommon circumstances, which continued a long time. On comparing together the Particulars of their Disorder, they agreed in suspecting that possibly some effluvia from the Body might have been the occasion of that Disorder in them both; perhaps they were mistaken. But as we do not yet know with Certainty how long the Power of Infection may in some Bodies be retained, it seems well in such Cases to be cautious till farther Light shall be obtained. . . .

A few references may be found in Franklin's diary kept from 1780 to 1784

Friday, 29th, 1780. Went by particular invitation to the Sorbonne, to an assembly of the Faculty of Physic on the College Hall, where we had the eloge of my friend M. Dubourg and other pieces. Suffered by the cold. . . .

July 3d, 1784. Mr. Smeathman comes and brings two English or Scotch Gentlemen; one a Chevalier of some Order, the other a Physician who had lived long in Russia. Much Conversation. Putrid Fevers common in Russia, and in Winter much more than in Summer, therefore supposed to be owing to their hot Rooms. In a gentleman's House there are sometimes one hundred domestics; these have not beds, but sleep twenty or thirty in a close room warmed by a stove, lying on the floor and on benches. The stoves are heated by wood. As soon as it is burnt to coals, the chimney is stopped to prevent the escape of hot and entry of cold air. So they breathe the same air over and over again all night. These fevers he cured by wrapping the patient in linen wet with vinegar, and making them breathe the vapor of vinegar thrown on hot bricks. The Russians have the art of distilling spirit from milk. To prepare it for distillation it must, when beginning to sour, be kept in continual motion or agitation for twelve hours; it then becomes a uniform vinous liquor, the cream, curd, and aqueous part or whey, all intimately mixed. Excellent in this state for restoring emaciated bodies. This operation on

[1] Cold is a general name given by the English to all sorts of Rheumas and Catarrhs.

milk was discovered long since by the Tartars, who in their rambling life often carry milk in leather bags on their horses, and the motion produced the effect. It may be tried with us by attaching a large keg of milk to some part of one of our mills. . . .

An intensely interesting medical reference is in the Diary of Manasseh Cutler, of Massachusetts, under date of July 13, 1787, in which he describes a visit to Franklin's house in Philadelphia and among other things that Cutler saw was the library; he says: "I presume this is the largest and by far the best library in America. He showed us a glass machine for exhibiting the circulation of the blood in the arteries and veins of the human body. The circulation is exhibited by the passing of a red fluid from a reservoir into numerous capillary tubes of glass, ramified in every direction, and then returning in similar tubes to the reservoir, which was done with great velocity, without any power to act visibly upon the fluid, and had the appearance of perpetual motion. But what the Doctor wished principally to show me was a huge volume on botany, which indeed afforded me the greatest pleasure of any one thing in his library. It was a single volume, but so large, that it was with great difficulty that he was able to raise it from a low shelf, and lift it on the table. But, with that senile ambition, which is common to old people, he insisted on doing it himself, and would permit no person to assist him, merely to show us how much strength he had remaining. It contained the whole Linnaeus's[1] Systema Vegetabilium, with large cuts of every plant, coloured from nature. It was a feast to me, and the Doctor seemed to enjoy it as well as myself. We spent a couple of hours in examining this volume, while the other gentlemen amused themselves with other matters. The Doctor is not a botanist, but lamented he did not in early life attend to this science. He delights in natural History."

Provost Smith who was not a good friend of Franklin's, but who was willing to preach a sermon about him after he died, said that Benjamin Franklin found the Pulse-Glass in Germany and introduced it into England, with Improvements of his own.

[1] Carl Linnaeus, 1707–1778. A celebrated Swedish botanist and naturalist. Professor of Botany at Upsal thirty-seven years. Author of a number of epoch-making works on these subjects.

FIG. 27.—"Magnétisme Animal." An old French caricature showing the so-called "Bucket" used by Mesmer.

Fig. 28.—Friederich Anton Mesmer. Engraved by Jules Porreau.
In the author's collection

A very extraordinary incident in Franklin's life was his appointment on the commission to investigate the claims of Friederich Anton Mesmer.

The King of France chose as members of this commission four celebrated French physicians of the Faculty of Paris; these were Majault, Sallin, D'Arcet, and Guillotin, together with five members of the Royal Academy who were to confer with the others.

Franklin's name appeared first, followed by that of Le Roy, Bailly, de Bory, and Lavoisier, all distinguished scientists and men of note.

This was in 1784, Franklin was living at Passy just outside Paris.

The appointment of a foreigner on such a commission was indeed a great honor, a mark of appreciation, and one that would have been tendered to but very few others, if to any.

What is more, Franklin drew up the report, he having been largely instrumental in exposing Mesmer, a part he was eminently fitted for, and one in which it is easy to believe he took much satisfaction, if not actual pleasure in doing.

His was a mind not easily deceived by tricks and frauds, his matter-of-fact way of taking a common sense view of such affairs, would have seen behind the curtain of deception and folly practiced by Mesmer, who at the time was deluding thousands of dupes and relieving them of thousands of pounds.

Franklin's own copy of the report is in the Library of the Pennsylvania Historical Society, and is a pamphlet of 80 pages describing the proceedings of the commission, who investigated the subject for five months.

This report is still worth reading and every student of mesmerism or of mental therapeutics would do well to peruse it.

In 1837 there was published in Philadelphia a translation of the Report of the commissioners, together with a few other pieces connected with the subject of animal magnetism:

"Animal Magnetism. Report of Dr. Franklin and other commissioners, charged by the King of France with the examination of the animal

[1] Friederich Anton Mesmer. 1734–1815. Founder of the doctrine of Mesmerism or animal magnetism. Born in Suabia. Graduated from Vienna and then travelled widely, returning to Vienna he began to practice his deceptions, was compelled to leave that city within twenty-four hours through the report of a commission appointed by Maria Theresa. Went to Paris where he had a great success.

magnetism as practiced at Paris. Translated from the French. With an Historical Outline of the "Science," etc. Philadelphia, 1837."

A translation had also appeared in 1785 in London.[1]

From the Report we learn that all the commissioners attended public exhibitions of M. Deslon, one of Mesmer's followers, then they all privately submitted themselves to the action of the magnetism under the direction of M. Deslon and at his house. Not one of the commissioners felt any sensation from this process.

In addition the commissioners decided to make experiments upon persons really diseased, and chose them first out of the lower classes.

Seven of these meetings were held at Dr. Franklin's house at Passy, and M. Deslon performed the operations.

The widow Saint-Amand, asthmatic having the belly, legs, and thighs swelled, and dame Anseaume, who had a swelling upon her thigh, felt no sensation. In four no effects were felt, and three did experience some effects from the operation.

Then to obtain further light it was resolved to select some patients from the polite world and Mesdames de B—— and de V——, Messieurs M—— and R—— were admitted to the private bucket together with the commissioners. This bucket was a wooden box with a number of iron jointed rods projecting from it which could be held against the part of the body that was diseased. M. R——, whose distemper was the remainder of an obstruction of the liver, underwent the operation three times and felt nothing. Madame de B—— severely attacked with a nervous disorder, was several times on the point of falling asleep.

Dr. Franklin, though the weakness of his health hindered him from coming to Paris, was magnetised at his own house at Passy.

At the end of the Report may be found the conclusions arrived at.

"The commissioners having convinced themselves that the animal magnetic fluid is capable of being perceived by none of our senses, and had no action upon themselves or upon the subjects of their several experiments, being assured, that the touches and compressions employed in its application rarely occasioned favourable changes, in the animal

[1] Report of Dr. Benjamin Franklin, and other Commissioners charged by the King of France with the examination of the Animal Magnetism, as now practised at Paris. Translated from the French, with an Historical introduction. London, 1785.

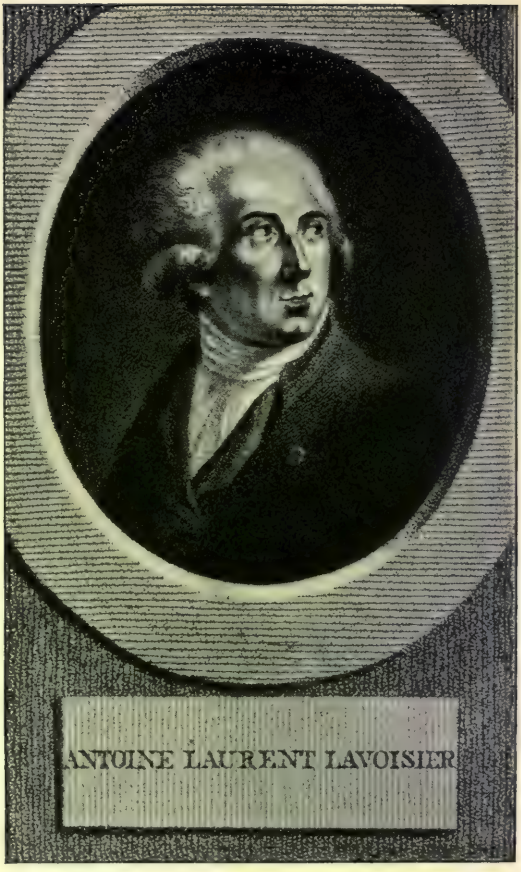


Fig. 29.—Antoine Laurent Lavoisier. Engraved by L. Portman.

economy, and that the impressions thus made are always hurtful to the imagination; in fine, having demonstrated by decisive experiments, that the imagination without the magnetism produces convulsions, and that the magnetism without the imagination produces nothing; they have concluded with an unanimous voice respecting the existence and the utility of the magnetism, that the existence of the fluid is absolutely destitute of proof, that the fluid having no existence can consequently have no use, that the violent symptoms observed in the public process are to be ascribed to the compression, to the imagination called into action and to that propensity to mechanical imitation, which leads us in spite of ourselves to the repetition of what strikes our senses, and at the same time they think themselves obliged to add as an important observation, that the compressions and the repeated action of the imagination employed in producing the crisis may be hurtful, that the sight of these crises is not less dangerous on account of that imitation which nature seems to have imposed upon us as a law, and that of consequence every public process, in which the means of the animal magnetism shall be employed cannot fail in the end of producing the most pernicious effects. . . . The commissioners were of consequence obliged to conclude that not only the measure in a particular mode of proceeding but the measures of a magnetism in general, might in the end produce the most pernicious effects.

"Paris, the 11th day of August, 1784.

(signed)	B. Franklin	Sallin	de Bory
	Majault	Bailly	Guillotin[1]
	le Roy	d'Arcet	Lavoisier[2]"

Franklin's first reference to this subject was in the following letter written just about the time the commission began its labor, though no reference is made to that body.

[1] Joseph Ignace Guillotin, 1738–1814. A French physician. One of the founders of the Academy of Medicine in Paris. He contemplated removing to America with a party of twelve intending to settle near Louisville, Kentucky, but the death by drowning in the Ohio river of one of his companions who had started in advance, deterred him. Franklin wrote him several letters in this connection.

[2] Antoine Laurent Lavoisier, 1743–1794. An illustrious French chemical philosopher and the chief founder of modern chemistry and of quantitative analysis. Was guillotined in 1794.

Passy, March 19, 1784.

To La Sabliere De La Condamine.

Sir:—I received the very obliging Letter you did me honour of writing to me the 8th inst. with the epigram etc. for which please to accept my Thanks.

You desire my Sentiments concerning the Cures perform'd by Comus & Mesmer. I think that in general Maladies caus'd by Obstructions may be treated by Electricity with Advantage. As to the Animal Magnetism, so much talk'd of, I am totally unacquainted with it, and must doubt its Existence till I can see or feel some Effect of it. None of the Cures said to be perform'd by it, have fallen under my Observation; and there being so many Disorders which cure themselves and such a Disposition in Mankind to deceive themselves and one another on these Occasions, and living long having given me frequent Opportunities of seeing certain Remedies cry'd up as curing everything, and yet soon after totally laid aside as useless. I cannot but fear that the Expectation of great Advantage from the new method of treating Diseases, will prove a Delusion. That Delusion may however in some cases be of use while it lasts. There are in every great City a Number of Persons who are never in health, because they are fond of Medicines and always taking them, whereby they derange the natural Functions, and hurt their Constitutions. If these People can be persuaded to forbear their Drugs in Expectation of being cured by only the Physician's Finger or an Iron Rod pointing at them, they may possibly find good Effects tho' they mistake the Cause. I have the honour to be, Sir, &c.

B. Franklin.

Just after the report had appeared Franklin wrote to his grandson.

Passy, Aug. 25, 1784. Wednesday.

To William Temple Franklin.

. . . The Report is published and makes a great deal of Talk. Everybody agrees that it is well written; but many wonder at the Force of Imagination describ'd in it, as occasioning Convulsions, etc., and some fear that Consequences may be drawn from it by Infidels to weaken our Faith in some of the Miracles of the New Testament. I send you two more Copies. You would do well to give one to the French Ambassador, if he has not had it. Some think it will put an End to

Joseph Ignace Guillotin,
Dr. Regent de l'ancienne Faculté de Médecine, etc.
Né à Saintes, le 28 Mai 1738,
Mort à Paris, le 25 Mars 1814.

FIG. 30.—Dr. Joseph Ignace Guillotin. From a rare French lithograph in the author's possession.

Mesmerism. But there is a wonderful deal of Credulity in the World, and Deceptions as absurd, have supported themselves for Ages.

I send you a few more Letters and am

Your affectionate Grandfather,

B. Franklin.

Passy, Sept. 8, 1784.

And again:

. . . P. S. Mesmer has complain'd to the Parliament of our Report, and requested that they would appoint Commissaries, to whom he might submit the Examination of—not his Theory and Practice, but—un Plan qui renfermera les seuls moyens possibles de constater infailliblement l'existence & l'utilite de sa decouverte. The Petition was printed. Many thought the Parliament would do nothing in it. But they had laid hold of it to clinch Mesmer, and obliged him to expose all directly. So that it must be seen whether there is any difference between his Art & Desler's. . . .

A curious reference may be found in the following letter to the success attending Franklin's medical advice and the consideration with which it was received.

Passy, March 17, 1783.

To the Earl of Buchan.

I do not recollect the Circumstances you are pleas'd to mention, of my having sav'd a citizen of St. Andrew's, by giving a Turn to his disorder, and I am curious to know what the Disorder was, and what the Advice I gave which proved so salutary. With great Regard, I have the honour to be, &c.

B. Franklin.

It was a fever of which the Earl of Buchan, then Lord Cardross, lay ill at St. Andrews, and the advice was not to blister, according to the old practice, and the opinion of the learned Doctor Simpson, brother of the celebrated geometrician at Glascow.

In the American Philosophical Society is the original letter from the Earl of Buchan to Franklin, to which the above is a reply. It is dated February 18, 1783, and in it the Earl writes: "You were entitled to a civic crown on my account a great many years ago, when, at the Univer-

sity of St. Andrews, you gave a turn to the career of a disorder, which then threatened my life."

On April 25, 1783, Guinchard of Armojon, writes to Dr. Franklin and tells him of the results obtained with the electrical treatment of a little two year old paralytic girl, and begs Franklin's opinion and advice.

Another reference to his gout.

Passy, Sept. 7, 1783.

To Mrs. Mary Hewson.

I have been lately ill with a Fit of the Gout, if that may indeed be called a Disease. I rather suspect it to be a Remedy, since I always find my Health and Vigour of Mind improv'd after the Fit is over. I am ever, my dear Friend, yours most affectionately,

B. Franklin.

On Nov. 15, 1783, one, Rouzier of Montargis, writes an account of his sufferings from gout and begs Dr. Franklin to aid him in regaining his health.

Many references appear in the later years to the stone that Franklin had in his bladder.

Passy, December 6, 1783.

To Comte De Vergennes.

Sir: Being now disabled by the Stone, which in the easiest Carriage gives me Pain, wounds my Bladder, and occasions me to make bloody Urine, I find I can no longer pay my Devoirs personally at Versailles, which I hope will be excused.

Passy, Jan. 6, 1784.

To John Jay.

It is true, as you have heard, that I have the stone, but not that I had thoughts of being cut for it. It is as yet very tolerable. It gives me no pain but when in a Carriage on the Pavement, or when I make some quick movement. If I can prevent its growing larger, which I hope to do by abstemious living and gentle exercise, I can go on pretty comfortably with it to the end of my Journey, which can now be at no great distance. I am cheerful, enjoy the company of my Friends, sleep well, have sufficient appetite, and my Stomach performs well its Func-

tions. The latter is very material to the preservation of Health. I therefore take no Drugs, lest I should disorder it. You may judge that my Disease is not very grievous, since I am more afraid of the Medicines than of the Malady. . . .

How delightfully polite and non-committal is the following letter to some one who evidently recommended some treatment to Franklin for his stone and gravel.

Passy ce 12 Septembre, 1784.

To an unknown correspondent.

J'ai reçu Monsieur, la Letter que vous m'avez fait l'honneur de m'écrire le 8 de ce Mois. Je suis bien sensible à l'intéret que vous voulez bien prendre à ma Santé, et Je vous suis infiniment obligé ainsi qu'à M. Dubourg; de la Communication de votre Reméde contre la Pierres et la Gravelle. Ma Maladie avant été ( ) supportable j'usqu'à ce Jour, Je ne suis point encore déterminé à faire usage d'aucun Médicament. Si le Mal augmentoit par la suite et que Je me visse obligé d'avoir recours à votre Recette, Je me ferai un Devoir de vous faire part du Succès. Agréez, Je vous prie, mes sinceres Remercimens et les Sentiment d'estime et de Reconnoissance avec les quels J'ai l'honneur d'être, Monsieur,

Votre très humble et très obeissant serviteur,

B. Franklin.

On April 15, 1785, John Jones wrote and desired Franklin's opinion of the Russian vapor baths as described in a paper by Dr. Sanchez.

Notwithstanding the statement made in the above letter Franklin was probably taking medicine for the stone.

Passy, April 21, 1785.

To Benjamin Vaughan.

Dear Friend:

I received your kind letter of the 23d past, by Mr. Perry, with the other bottle of Blackrie. . . .

Another account of Franklin's treating nervous diseases by electricity is here given.

Passy, April 29, 1785.

To Jan Ingenhousz.[1]

. . . You will find an Acct. of the first great Stroke I received, in pages 161, 162, of my Book, 5th Edition, 1774. The second I will now give you. I had a Paralytick Patient in my Chamber whose Friends brought him to receive some Electric Shocks. I made them join Hands so as to receive the Shock at the same time, and I charg'd two large Jars to give it. By the Number of those People, I was oblig'd to quit my usual Standing, and plac'd myself inadvertently under an Iron Hook which hung from the Ceiling down to within two Inches of my Head, and communicated by the Wire with the outside of the Jars. I attempted to discharge them, and in fact did so, but I did not perceive it, tho' the charge went thro' me, and not through the Persons I intended it for. I neither saw the Flash, heard the Report, nor felt the Stroke. When my Senses returned, I found myself on the Floor. I got up, not knowing how that had happened. I then again attempted to discharge the Jars; but one of the Company told me they were already discharg'd, which I could not at first believe, but on Trial found it true. They told me they had not felt it, but they saw I was knock'd down by it, which had greatly surprised them. On recollecting myself, and examining my Situation, I found the Case clear. A small swelling rose on the Top of my Head, which continued sore for some Days, but I do not remember any other Effect good or bad.

The Stroke you received, and its Consequences, are much more curious. I communicated that Part of your Letter to an Operator, encourag'd by Government here to electrify epileptic and other poor Patients, and advis'd his trying the Practice on Mad People according to your Opinion. I have not heard whether he has done it. . .

In this same letter he reverts to that old hobby of his, infection remaining in dead bodies.

[1] Jan Ingenhousz, 1730–1799. An eminent Dutch physician and chemist. About 1767 visited London where he met Sir John Pringle, through whom he became physician to the Empress Maria Theresa in 1772. After remaining in Vienna a number of years he travelled in France, Italy, etc., pursuing his scientific studies and experiments, and at last settled in London. Fellow of the Royal Society. Dr. Ingenhousz conveyed to Franklin an invitation from the Emperor to visit Vienna. There are in existence nearly a hundred letters of his to Franklin, but all but about fifteen of Franklin's replies are apparently lost.

Fig. 31.—Dr. Jan Ingenhousz. From a rare engraving made at Rome in 1769 by Cunego, from a drawing by A. L. L. from life. In the author's collection.

. . . Your ideas of the long Conservation possible of the Infection of some Diseases appear to me well-founded. I heard in England of one Instance. In a Country Village where the Small Pox had not been for 30 Years, a Grave was opened for the Interment of a Person dead of some common Distemper, whose Funeral was accompanied by most of the Inhabitants of the Village. The Grave digger, had in his Operation broke the Coffin of a neighboring Corpse which had dy'd of the Small-Pox thirty years before. Those who attended the Ceremony of the Interment were sensible of a bad Smell issuing from the Grave, and after some Days were all taken down with that Distemper. You may yourself remember a stronger Instance. It happen'd during my Absence from England between August 1762 and December 1764, and therefore I may not be perfect in the Circumstances. A number of Physicians, as I heard, amus'd themselves with the Dissection of an Egyptian Mummy, which must have been more than Two Thousand Years old, and several of them dyd soon after of putrid Fevers, suspected to be caught at that Dissection. . . .

And also in the same letter he speaks of Blackrie's Solvent, previously mentioned.

. . . I thank you much for the Postscript respecting my Disorder the Stone. I have taken heretofore, and am now again taking the Remedy you mention, which is called *Blackrie's Solvent*. It is the Soap Lie, with Lime Water, and I believe it may have some Effect in diminishing the Symptoms, and preventing the Growth of the Stone, which is all I expect from it. It does not hurt my Appetite; I sleep well, and enjoy my Friends in chearful Conversation as usual. But, as I cannot use much Exercise, I eat more sparingly than formerly, and I drink no Wine. . . .

And towards the end of this same very long letter there is mention of Mesmer.

. . . Mesmer continues here and has still some Adherents and some Practice. It is surprizing how much Credulity still subsists in the World. I suppose all the Physicians in France put together have not made as much Money during the Time he has been here, as he has done.

And we have now a fresh Folly. A Magnetiser pretends that he can by establishing what is called a *Rapport* between any Person and a Somnambule, put it in the Power of that Person to direct the Actions of the Somnambule, by a simple strong Volition only, without Speaking or making any Signs; and many People daily flock to see this strange Operation. . . .

The following extract from the Preface of Volume X of Smyth's edition of Franklin's Life and Writings is interesting and strange, possibly some future medical historian will solve the riddle. It seems very unlikely that Franklin could have had anything to do with the authorship of this manuscript, some reference in his letters would certainly have been found.

. . . "It will be noticed that I have adopted throughout these volumes the Austrian way of spelling the name of Ingenhousz. In the published works of that distinguished philosopher, and in the authorized translations of them, the name is spelled Ingen Housz. He signed himself Ingen Housz, and sometimes in familiar letter J. Housz. A descendant of this illustrious man, Dr. Oskar Freiherr von Mitis, an official of the K. and K. Haus-, Hof- und Staatsarchiv, with great and generous kindness, sent me a strange manuscript volume entitled "Consultatio Medica super proprium morbum autographa Benjamini Franklin ad joannem Ingenhousz." The volume contains two manuscripts, the first consisting of seventy-six pages and containing about seventeen thousand words. The second is an amplification and extension of the first and written in an almost microscopic hand, its seventy pages containing not less than seventy-eight thousand words. The first part Caput 1. De Nature Morbi—is in the hand writing of the elder Jacquin, Nikolaus Josef, the celebrated botanist. The second part, beginning Pathologiæ, Pars prima, is believed in Germany to have been written either by Ingenhousz, the uncle of Jacquin, or by Franklin. Upon the paper cover is written "Has immortalis viri reliquias sociis et amicis religiose asservandas tradit" (signed) Jacquin. Freiherr von Mitis assures me that this is unquestionably in the handwriting of Jacquin, and that there can be no doubt of his love of truth. The cover is slightly scorched, for the manuscript was rescued from the fire, together with a

few other papers, in 1848 by Karl von Schreiber, son-in-law of Jacquin. Since 1852 this mysterious volume has been in the possession of the family of Von Mitis, and although it has been frequently examined, no information has been obtained concerning its origin. It corresponds with no known writing of Igenhousz or Franklin. It is identical with no other manuscript. And yet the testimony of Jacquin is precise and reverent, and the document has never departed from the descendants of Igenhousz." . . .

Other references to Blackrie are as follows:

Passy, May 19, 1785.

To Jonathan Williams.

My Disorder has its bad and good Days. At present I am tolerably affected by it; but sometimes the Pain is hard to bear. I wish you to buy and send me Blackrie's Disquisition on Medicines that dissolve the Stone. You will find it at Wilkie's No. 71, Paul's Churchyard. I am ever, your Affectionate Uncle B. Franklin.

To Caleb Whitefoord.

Passy, May 19, 1785.

My dear old Friend:

I have desired my Nephew Mr. Williams to buy a Book for me, Blackrie's Disquisitions upon Medicines for dissolving the Stone. It treats I understand of the Sope-Lye, which is recommended in the Pamphlet you were so kind as to send me. . . .

In a very long letter Franklin discusses many things, some humorously, others seriously. His own ailments he makes fun about.

The account of the Foundling Hospital at Paris shows us that he was a strong opponent of race suicide. He favored large families and he urged the proper care of children after they were born.

Then in another part of this same interesting letter there is the description of one of Franklin's inventions—bifocal lenses—as they are now called. This invention entitles him to a high rank among ophthalmologists.

Passy, May 23, 1785.

To George Whatley.

. . . I must agree with you, that the Gout is bad, and that the Stone is worse. I am happy in not having them both together, and I join in your Prayer, that you may live till you die without either. . . .

. . . I like better the concluding Sentiment in the old Song call'd *The Old Man's Wish*, wherein, after wishing for a warm House in a country Town, an easy Horse, some good old authors, ingenious and cheerful Companions, a Pudding on Sundays, with stout Ale, and a bottle of Burgundy, &c., &c., in separate Stanzas, each ending with this burthen:

> "May I govern my Passions with an absolute sway,
> Grow wiser and better as my Strength wears away,
> Without Gout or Stone, by a gentle Decay"; . .

But what signifies our Wishing? Things happen, after all, as they will happen. I have sung that *wishing Song* a thousand times; when I was young, and now find, at Four-score, that the three Contraries have befallen me, being subject to the Gout and the Stone, and not being yet Master of all my Passions. Like the Proud Girl in my Country, who wished and resolv'd not to marry a Parson, nor a Presbyterian, nor an Irishman; and at length found herself married to an Irish Presbyterian Parson. . . .

. . . I return your Note of Children receiv'd in the Foundling Hospital at Paris, from 1741 to 1755, inclusive; and I have added the Years preceding as far back as 1710, together with the general Christnings of the City, and the Years succeeding down to 1770. Those since that Period I have not been able to obtain. I have noted in the Margin the gradual Increase, viz. from every tenth Child so thrown upon the Public, till it comes to every third! Fifteen Years have passed since the last Account, and probably it may now amount to one-half. Is it right to encourage this monstrous Deficiency of natural Affection? A Surgeon I met with here excused the Women of Paris, by saying, seriously, that they could not give suck; "Car," dit il, "elles n'ont point de tetons." He assurr'd me it was a Fact, and bade me look at them, and observe how flat they were on the Breast; "they have nothing more there," said he, "than I have upon the Back of my hand." I have since thought that there might be some Truth in his Observation, and that, possibly, Nature, finding they made no use of Bubbies, has left off giving them

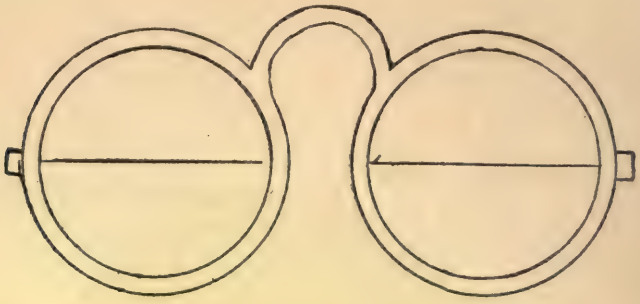
any. Yet, since Rousseau, with admirable Eloquence, pleaded for the Rights of Children to their Mother's milk, the Mode has changed a little, and some Ladies of Quality now suckle their Infants and find Milk enough. May the Mode descend to the lower Ranks, till it becomes no longer the Custom to pack their Infants away, as soon as born, to the Enfans Trouvés, with the careless Observation, that the King is better able to maintain them.

I am credibly inform'd that nine-tenths of them die there pretty soon, which is said to be a great Relief to the Institution, whose Funds would not otherwise be sufficient to bring up the Remainder. Except the few Persons of quality above mentioned, and the Multitude who send to the Hospital, the Practice is to hire Nurses in the Country to carry out the Children, and take care of them there. There is an Office for examining the Health of Nurses, and giving them Licenses. They come to Town on certain Days of the week in Companies to receive the Children, and we often meet Trains of them on the Road returning to the neighboring Villages, with each a Child in her Arms. But those, who are good enough to try this way of raising their Children, are often not able to pay the Expense, so that the Prisons of Paris are crowded with wretched Fathers and Mothers confined pour Mois de Nourrice, tho' it is laudably a favorite Charity to pay for them, and set such Prisoners at Liberty. I wish Success to the new Project of assisting the poor to keep their Children at home, because I think there is no Nurse like a Mother (or not many), and that, if Parents did not immediately send their Infants out of their Sight, they would in a few days begin to love them, and thence be spurr'd to greater Industry for their Maintenance. . . .

. . . By Mr. Dollond's[1] Saying, that my double Spectacles can only serve particular Eyes, I doubt he has not been rightly informed of their Construction. I imagine it will be found pretty generally true, that the same Convexity of Glass through which a Man sees clearest and best at the Distance proper for Reading, is not the best for greater Distances. I therefore had formerly two Pair of Spectacles, which I shifted occasionally, as in travelling I sometimes read, and often wanted to regard the Prospects. Finding this Change troublesome, and not

[1] Peter Dollond, 1730–1820. A son and successor of John Dollond, the eminent English optician. Improved Hadley's quadrant and wrote a treatise on telescopes.

always sufficiently ready, I had the Glasses cut, and half of each kind associated in the same Circle, thus



By this means, as I wear my Spectacles constantly, I have only to move my Eyes up or down, as I want to see distinctly far or near, the proper Glasses being always ready. This I find more particularly convenient since my being in France, the Glasses that serve me best at Table to see what I eat, not being the best to see the Faces of those on the other Side of the Table who speak to me; and when one's Ears are not well accustomed to the Sounds of a Language, a Sight of the Movements in the Features of him that speaks helps to explain, so that I understand French better by the help of my Spectacles. . . .

A number of engravings show Franklin wearing glasses shaped like the drawing above and I believe I have seen one representing the divided lenses.

The following letter tells how closely in touch Franklin kept with the leading physicians of London.

Southampton, July 26, 1785.

To J. Coakley Lettsom.[1]

Dear Sir: I received your kind letter, and the valuable present of Dr. Fothergill's Works, for which please to accept my grateful acknowledgements. I purpose, on my voyage, to write the remaining notes of my life, which you desire, and to send them to you on my arrival. You

[1] J. Coakley Lettsom, 1744-1815. "The busiest, most philanthropic and most successful physician of his day, as well as a ready writer." It is said that his practice sometimes brought him in £12,000 a year.

FIG. 32.—Dr. John Coakley Lettsom.

have done a good deed in contributing to promote science among us, by your liberal donation of books to Carlisle College. Thanks for your good wishes in favour of our country, and of your friend and servant.

B. Franklin.

In 1801 the Managers of the Pennsylvania Hospital wishing to have an engraving of the Hospital for use on the certificates given the students, who had attended the practice of the house, sent a drawing to Dr. Lettsom with the request that he have a plate engraved. This Lettsom did, employing an artist named Cooke, after consultation with Benjamin West. An older engraving of a similar certificate is shown in Fig. 4.

Franklin's celebrated letter on the Causes and Cure of Smoky Chimneys which was published in the Transactions of the American Philosophical Society was addressed to a great friend of his, a celebrated physician of Vienna. A small portion of this letter refers to Franklin's hobby—fresh air.

At Sea, August 28, 1785.

To Jan Ingenhousz.

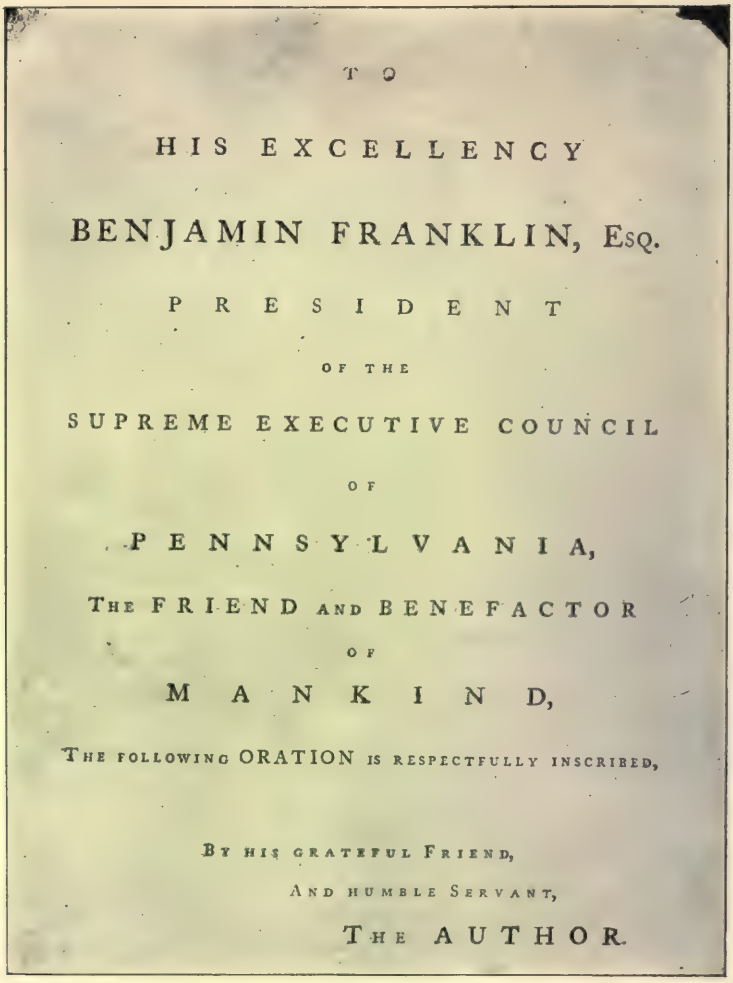
. . . For many Years past, I have rarely met with a Case of a Smoky Chimney, which has not been solvable on these Principles, and cur'd by these Remedies, where People have been willing to apply them; which is indeed not always the Case; for many have Prejudices in favour of the Nostrums of pretending Chimney Doctors and Fumists, and some have Conceits and Fancies of their own, which they rather chuse to try, than to lengthen a Funnel, alter the Size of an Opening, or admit Air into a Room, however necessary; for some are as much afraid of fresh Air as persons in the Hydrophobia are of fresh Water. I myself had formerly this Prejudice, this *Aërophobia*, as I now account it; and, dreading the suppos'd dangerous Effects of cool Air, I consider'd it as an Enemy, and clos'd with extreme care every crevice in the Rooms I inhabited.

Experience has convinced me of my Error. I now look upon fresh Air as a Friend; I even sleep with an open Window. I am persuaded, that no common Air from without is so unwholesome, as the Air within a close Room, that has been often breath'd and not changed. Moist Air, too, which formerly I though pernicious, gives me now no apprehensions; for, considering that no Dampness of Air apply'd to the Outside of

my Skin can be equal to what is apply'd to and touches it within, my whole Body being full of Moisture and finding that I can lie two hours in a Bath twice a Week cover'd with Water, which certainly is much damper than any Air can be, and this for Years together, without catching Cold, or being in any other manner disorder'd by it, I no longer dread mere Moisture, either in Air or in Sheets or Shirts; And I find it of Importance to the Happiness of Life, the being freed from vain Terrors, especially of objects that we are every day expos'd inevitably to meet with. You Physicians have of late happily discover'd, after a contrary Opinion had prevail'd some Ages, that fresh and Cool Air does good to Persons in the Small Pox and other Fevers. It is to be hop'd that in another Century or two we may all find out, that it is not bad even for People in Health. And as to moist Air, here I am at this present Writing in a Ship with above 40 Persons, who have had no other but moist Air to breathe for 6 Weeks past; everything we touch is damp, and nothing dries, yet we are all as healthy as we should be on the Mountains of Switzerland, whose Inhabitants are not more so than those of Bermuda or St. Helena, Islands on whose Rocks the Waves are dash'd into Millions of Particles, which fill the Air with Damp, but produce no Diseases, the Moisture being pure, unmix'd with the poisonous Vapours arising from the putrid Marshes and stagnant Pools in which many Insects die and corrupt the Water. These Places only, in my Opinion (which however I submit to yours,) afford unwholesome Air; and that it is not the mere Water contain'd in damp Air, but the volatile Particles of corrupted animal Matter mix'd with that Water, which renders such Air pernicious to those who breathe it. And I imagine it a Cause of the same kind that renders the Air in close Rooms, where the perspirable Matter is breath'd over and over again by a number of assembled People, so hurtful to Health. After being in such a Situation, many find themselves affected by that Febricula, which the English alone call a Cold, and, perhaps from the Name, imagine that they caught the malady by going out of the Room, when it was in fact by being in it.

You begin to think, that I wander from my Subject, and go out of my Depth. So I return again to my Chimneys. . . .

An interesting letter is here printed together with the reply


TO

HIS EXCELLENCY

BENJAMIN FRANKLIN, Esq.

PRESIDENT

OF THE

SUPREME EXECUTIVE COUNCIL

OF

PENNSYLVANIA,

THE FRIEND AND BENEFACTOR

OF

MANKIND,

THE FOLLOWING ORATION IS RESPECTFULLY INSCRIBED,

BY HIS GRATEFUL FRIEND,

AND HUMBLE SERVANT,

THE AUTHOR.

FIG. 33.—Dedication from Dr. Benjamin Rush's Oration on the Influence of Physical Causes on the Moral Faculty. From a copy in the author's library.

Philadelphia, March, 1786.

To Benjamin Rush.

My Dear Friend:

During our long acquaintance, you have shown many instances of your regard for me; yet I must now desire you to add one more to the number, which is, that, if you publish your ingenious discourse[1] on the Moral Sense, you will totally omit and suppress that most extravagant encomium on your friend Franklin, which hurt me exceedingly in the unexpected hearing, and will mortify me beyond conception, if it should appear from the press. Confiding in your compliance with this earnest request, I am ever, my dear friend, yours most affectionately,

B. Franklin.

Dr. Rush replied to this letter as follows: "Agreeably to your request I have suppressed the conclusion of my oration, but I cannot bear to think of sending it out of our State or to Europe without connecting it with your name, I have therefore taken the liberty of inscribing it to you by a simple dedication, of which the enclosed is a copy. And, as you have never in the course of our long acquaintance refused me a single favour, I must earnestly insist upon your adding to my great and numerous obligations to you the permission which I now solicit, to send my last as I did my first publication into the world under the patronage of your name."

The following extracts from Benjamin Rush's writings referring to Franklin are of interest in this connection, by giving us the opinion which he, one of the greatest American physicians, held of Franklin.

. . . Sir John Pringle was between sixty and seventy years of age. He was then the Favorite physician of the Queen and Royal family. No relaxation appeared, Dr. Franklin (who was his intimate friend) informed me, in his exertions to obtain knowledge. . . .

. . . Dr. Franklin acted, while I was in London, as agent to several of the then American Colonies. It was my peculiar happiness

[1] The discourse here alluded to, On the Influence of Physical Causes on the Moral Faculty, was delivered before the American Philosophical Society, February 27th, 1786.

to be domesticated in his family. He introduced me to a number of his literary friends. He once took me to Court with him, and pointed out to me many of the most distinguished public characters of the nation. I never visited him without learning something. I shall mention a proof of his kindness to me in another place. . . .

. . . In February I set out for Paris with letters of introduction from Dr. Franklin, to several of his philosophical friends. When I parted with the Doctor he asked me, "how I was provided with money for my jaunt." I told him I believed I had enough. "Perhaps not, you may be exposed to unexpected expenses; here," said he, "is a credit upon a banker in Paris for two or three hundred guineas." I thankfully accepted his kind and generous offer. The issue of it will be mentioned hereafter. Nothing worth relating occurred in my journey to Paris. I arrived there in a few days after I left London, and was introduced by means of my letters to the following persons, Messrs. Dubourg, a physician, Le Roy, an Academician, Roux, Raume, Macquair, Chemists, Sue, the Anatomist, Nollet, lecturer upon natural philosophy, Jessieu, botanist to the king, Diderot, the philosopher and friend to Voltaire, and some others of less note. By means of Dr. Dubourg I was introduced to the Marquis of Mirabeau, who kept a coterie once a week at his house, to which I was invited. Upon my entering his room which was large and filled with ladies and gentlemen of the first literary characters in Paris, Dr. Dubourg announced me in the following words, "Voila, un ami de Mons. Franklin." The Marquis ran towards the door and took me by the hand, saying at the same time, "C'est assez." . . .

. . . A day or two after I arrived in London I called upon Dr. Franklin, and informed him that my expenses in Paris had so far exceeded my expectations that I had been obliged to avail myself of his kind offer, by drawing upon his banker for thirty guineas. He seemed pleased, and requested that I would pay them, when convenient, to his wife in Philadelphia. This I did, out of the first money I earned after my arrival. Mrs. Franklin for a long time refused to receive it, for the Doctor had not mentioned the debt to her in any of his letters. I take great pleasure in recording this delicate act of paternal friendship in Dr. Franklin. It attached me to him during the remainder of his life, and combined

with his character it has since his death, disposed me to respect and love all the branches of the family. . . .

. . . Dr. Priestly dined with me. His conversation was highly instructive. He said that he had been very intimate with Dr. Franklin and that from his often saying he should like to peep out of his grave a hundred years hence he concluded that he did not believe in a future state. . . .

In the *Pennsylvania Magazine of History and Biography* for January, 1905, will be found other references to Franklin in Dr. Rush's Diary.

One letter has been quoted about lead poisoning and another as important is here given in full, a letter that could aptly find a place in any modern text-book on the subject.

Philadelphia, July 31, 1786.

To Benjamin Vaughan.

Dear Friend:

I recollect that, when I had the great Pleasure of seeing you at Southampton, now a 12 month since, we had some Conversation on the bad Effects of Lead taken inwardly; and that at your Request I promis'd to send you in writing a particular Account of several Facts I then mention'd to you, of which you thought some good use might be made. I now sit down to fulfil that Promise.

The first Thing I remember of this kind was a general Discourse in Boston, when I was a Boy, of a Complaint from North Carolina against New England Rum, that it poison'd their People, giving them the Dry Bellyach, with Loss of the Use of their Limbs. The Distilleries being examin'd on the Occasion, it was found that several of them used leaden Still-heads and Worms, and the Physicians were of Opinion, that the Mischief was occasioned by the Use of Lead. The Legislature of the Massachusetts thereupon pass'd an Act, prohibiting under severe Penalties the Use of such Still-heads and Worms thereafter. Inclos'd I send you a Copy of the Acct. taken from my printed Law-book.

In 1724, being in London, I went to work in the Printing-House of Mr. Palmer, Bartholomew Close, as a Compositor. I there found a Practice, I had never seen before, of drying a Case of Types (which are wet in

Distribution) by placing it sloping before the Fire. I found this had the additional Advantage, when the Types were not only dry'd but heated, of being comfortable to the Hands working over them in cold weather. I therefore sometimes heated my case when the Types did not want drying. But an old Workman, observing it, advis'd me not to do so, telling me I might lose the use of my Hands by it, as two of our Companions had nearly done, one of whom that us'd to earn his Guinea a Week, could not then make more than ten Shillings, and the other, who had the Dangles, but seven and sixpence. This, with a kind of obscure Pain, that I had sometimes felt, as it were in the Bones of my Hand when working over the Types made very hot, induced me to omit the Practice. But talking afterwards with Mr. James, a Letter-founder in the same Close, and asking him if his People, who work'd over the little Furnaces of melted Metal, were not subject to that Disorder; he made light of any danger from the effluvia, but ascribed it to the Particles of the Metal swallow'd with their Food by slovenly Workmen, who went to their Meals after handling the Metal, without well washing their Fingers, so that some of the metalline Particles were taken off by their Bread and eaten with it. This appeared to have some Reason in it. But the Pain I had experienc'd made me still afraid of those Effluvia.

Being in Derbishire at some of the Furnaces for Smelting of Lead Ore, I was told, that the Smoke of those Furnaces was pernicious to the neighboring Grass and other Vegetables; but I do not recollect to have heard anything of the Effect of such Vegetables eaten by Animals. It may be well to make the Enquiry.

In America I have often observ'd that on the Roofs of our shingled Houses, where Moss is apt to grow in northen Exposures, if there be any thing on the Roof painted with white Lead, such as Balusters, or Frames of dormant Windows, &c, there is constantly a Streak on the Shingles from such Paint down to the Eaves, on which no Moss will grow, but the wood remains, constantly clean and free from it. We seldom drink RainWater that falls on our Houses; and if we did, perhaps the small quantity of Lead descending from such Paint might, not be sufficient to produce any sensible ill Effect on our Bodies. But I have been told of a Case in Europe, I forgot the Place, where a whole Family was afflicted with what we call the Dry Bellyach, or *Colica Pictonum*, by drinking RainWater. It was at a Country-Seat, which, being situated too high to

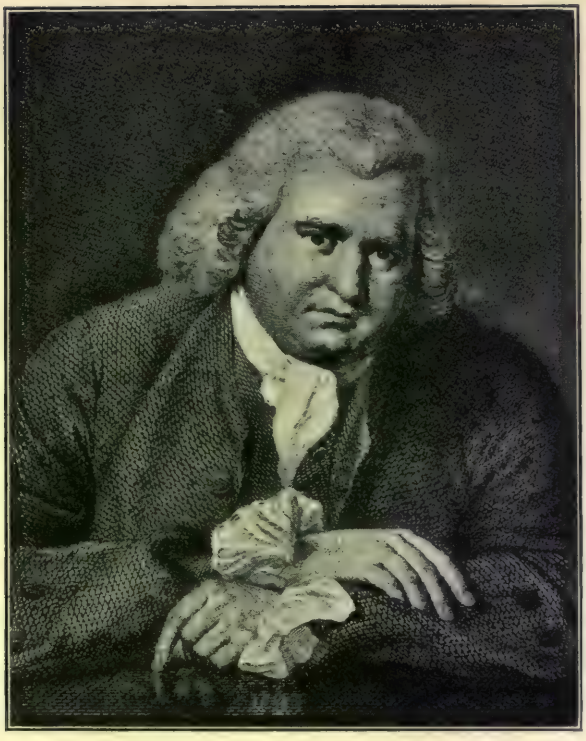


FIG. 34.—Dr. Erasmus Darwin.

Erasmus Darwin, 1731–1802. An English physician, physiologist, and poet. Founder of a system of Medicine. In 1788 he made the following prophesy: "Soon will the power of steam bear the fleet carriage along the road, soon will it bear the bark with certain course through the billows. Probably too it will, like the eagle, bear a new car through the kingdom of air on the nimble pinions of the wind to remote bounds." In 1771 Franklin visited Dr. Darwin at Litchfield.

have the Advantage of a Well, was supply'd with Water from a Tank, which received the Water from the leaded Roofs. This had been drunk several Years without Mischief; but some young Trees planted near the House growing up above the Roof, and shedding their Leaves upon it, it was suppos'd that an Acid in those Leaves had corroded the Lead they cover'd and furnish'd the Water of that with its baneful Particles and Qualities.

When I was in Paris with Sir John Pringle in 1767, he visited *La Charité*, a Hospital particularly famous for the Cure of that Malady, and brought from thence a Pamphlet containing a List of the Names of Persons, specifying their Professions or Trades, who had been cured there. I had the Curiosity to examine that List, and found that all the Patients were of Trades, that, some way or other, use or work in Lead, such as Plumbers, Glaziers, Painters, &c., excepting only two kinds, Stonecutters and Soldiers. These I could not reconcile to my Notion, that Lead was the cause of that Disorder. But on my mentioning this Difficulity to a Physician of that Hospital, he inform'd me that the Stonecutters are continually using melted Lead to fix the Ends of Iron Balustrades in Stone; and that the Soldiers had been employ'd by Painters, as Labourers, in Grinding of Colours.

This, my dear Friend, is all I can at present recollect on the Subject. You will see by it, that the Opinion of this mischievous Effect from Lead is at least above Sixty Years old; and you will observe with Concern how long a useful Truth may be known and exist, before it is generally receiv'd and practis'd on.

I am, ever, yours most affectionately,

B. Franklin.

How amused Franklin must have been when told the following story about his friend Dr. Erasmus Darwin. The anecdote can be found in *Physic and Physicians: A Medical Sketch Book.* London, 1839.

"An instance of Darwin's eccentricity is thus related. During his early residence at Litchfield, Mr. Sneyd, then of Bishton, and a few more gentlemen of Staffordshire, prevailed upon the poet to join them in an excursion by water, from Bishton to Nottingham, and on to Newark. They had provided themselves with a good supply of cold provisions and wine. It was midsummer, the day ardent and sultry. The noon-

tide meal had been made, and the glass gone duly round. It was one of those few instances, in which the medical votary of the Naiads transgressed his general and strict sobriety. If not absolutely intoxicated, his spirits were in a high degree of vinous exhiliration. On the boat approaching Nottingham, within the distance of a few fields, he surprised his companions by slipping, without any previous notice, from the boat into the middle of the river, and swimming to the shore. They saw him get upon the bank, and walk over the meadows towards the town. They called to him in vain; he did not once turn his head. Anxious lest he should take a dangerous cold by remaining in his wet clothes, and uncertain whether or not he intended to desert his party, they rowed instantly to the town, and went in search of the river god. In passing through the market-place, they saw him standing upon a tub, encircled by a crowd of people, and resisting the entreaties of an apothecary of the place, one of his old companions, who was importuning him to go to his house, and accept of other vestments, until his own could be dried. The party, on passing through the crowd, were surprised to hear him speaking without any degree of his usual stammering. . . .

"'Have I not told you,' said the Dr., 'that I had drunk a considerable quantity of wine before I committed myself to the river. You know my general sobriety, and, as a professional man, you ought to know that the unusual existence of internal stimulus would, in its effects on the system, counteract the external cold and moisture.' Then perceiving his companions near him, he nodded, smiled, waved his hand, and thus, without hesitation, addressed the populace:

"'Ye men of Nottingham, listen to me. You are ingenious and industrious mechanics. By your industry, life's comforts are procured for yourselves and families. If you lose your health, the power of being industrious will forsake you. That you know; but you may not know that to breathe fresh air constantly, is not less necessary to preserve health than sobriety itself. Air becomes unwholesome in a few hours, if the windows be shut. Open those of your sleeping-rooms whenever you quit them to go to your work-shops. Keep the windows of your work-shops open whenever the weather is not insupportably cold. I have no interest in giving you this advice. Remember what I, your countryman and physician, tell you. If you would not bring infection and disease upon yourselves, and to your wives and children, change the air

you breathe; change it many times a day, by opening your windows.' So saying, Dr. Darwin stepped from the tub, and returning with his party to the boat, they pursued their voyage."

Possibly Franklin was one of this party. I wish I could prove this were true. Darwin's views on fresh air sound very much like those so frequently advocated by Franklin. We do know that Franklin visited Dr. Darwin at Litchfield in 1771

Other references to his own physical ailments.

Philadelphia, April 15, 1787.

To M. Le Veillard.

. . . As to my malady, concerning which you so kindly inquire, I have never had the least doubt of its being the stone. I am sensible that it is grown heavier, but on the whole it does not give me more pain than when at Passy, and except in standing, walking, or making water, I am very little incommoded by it. Sitting or lying in bed I am generally quite easy, God be thanked; and as I live temperately, drink no wine, and use daily the exercise of the dumb-bell, I flatter myself that the stone is kept from augmenting so much as it might otherwise do, and that I may still continue to find it tolerable. People who live long, who will drink of the cup of life to the very bottom, must expect to meet with some of the usual dregs, and when I reflect on the number of terrible maladies human nature is subject to, I think myself favoured in having to my share only the stone and the gout. . . .

Philadelphia, April 18, 1787.

To Jean-Baptiste Le Roy.

. . . I had sometimes wished I had brought with me from France a balloon sufficiently large to raise me from the ground. In my malady it would have been the most easy carriage for me, being led by a string held by a man walking on the ground. . . .

Philadelphia, Nov. 19, 1787.

To Comte De Buffon.

Dear Sir:

I am honour'd by your Letter, desiring to know by what Means I am reliev'd in a Disorder, with which you are also unfortunately afflicted

as well as myself. I have try'd all the noted Prescriptions for diminishing the Stone without perceiving any good Effect. But observing Temperance in Eating, avoiding Wine and cyder, and using daily the Dumb Bell, which exercises the upper Part of the Body without much moving the Parts in contact with the Stone, I think I have prevented its Increase.

As the Roughness of the Stone lacerates a little the Neck of the Bladder, I find, that when the Urine happens to be sharp, I have much Pain in making Water and frequent Urgencies. For Relief under the Circumstances, I take, going to Bed, the Bigness of a Pigeon's Egg of Jelly of Blackberries. The Receipt for making it is enclos'd. While I continue to do this every Night, I am generally easy the day following, making Water pretty freely, and with long intervals. I wish most sincerely that this simple Remedy may have the same happy Effect with you. Perhaps Current Jelly, or the Jelly of Apples or Raspberries, may be equally serviceable; for I suspect the Virtue of this Jelly may lie Principally in the boiled Sugar, which is in some degree candied by the Boiling of the Jelly. Wishing you for your own Sake much more Ease, and for the Sake of Mankind many more years, I remain with the greatest Esteem and Respect, dear Sir, your affectionate and most obedient Servant.

Philadelphia, Feb. 11, 1788.

To Jan Ingenhousz.

My Dear Old Friend:

Your Letter of Sept. 28, 1787, came to my hands but about two Weeks since. It found me very ill with a severe Fit of the Stone, which follow'd a fall I had on the Stone Steps that lead into my Garden, whereby I was much bruised, and my Wrist sprained, so as not to be capable of Writing for several Weeks. . . .

Again Franklin discusses ophthalmological subjects.

Philadelphia (Oct. 22, 1788).

To the Duc De La Rochefoucauld.

. . . I thank you much for the Dissertation sur la Nyctalopie. It was quite a Novelty to me, having never before heard of such a Malady. One of our most ancient Physicians assures me, that tho' he had some knowledge of the Distemper from his Reading, he never knew of it in any Part of North America. Indeed we have no Chalk in this Country, nor

any Soil so white as to dazzle the Eyes when the Sun's Light is reflected from it. The Dissertation mentions that there are *terres crétacées*, &c. Are those *terres* white? . . .

The Duke had sent Franklin the dissertation in July, 1788, together with a letter stating that nyctalopia was a disease endemic in the neighbourhood of La Rocheguyon.

A letter showing how closely Franklin watched his own symptoms and what a keen observer he was of any changes. He here makes an important medical observation.

Philadelphia, Oct. 24, 1788.

To Jan Ingenhousz.

. . . You have always been kind enough to interest yourself in what relates to my health. I ought therefore to acquaint you with what appears to me something curious respecting it. You may remember the cutaneous malady I formerly complained of, and for which you and Dr. Pringle favoured me with prescriptions and advice. It vexed me near fourteen years, and was, the beginning of this year, as bad as ever, covering almost my whole body, except my face and hands; when a fit of the gout came on, without very much pain, but a swelling in both feet, which at last appeared also in both knees, and then in my hands. As these swellings increased and extended, the other malady diminished, and at length disappeared entirely. Those swellings have some time since begun to fall, and are now almost gone; perhaps the cutaneous disease may return or perhaps it is worn out. I may hereafter let you know what happened. I am on the whole much weaker than when it began to leave me. But possibly that may be the effect of age, for I am now near eighty-three, the age of commencing decrepitude. . . .

In addition to discussing again his stone, Franklin gives some advice about deafness, showing he had experimented even in this line.

Philadelphia, February 17, 1789.

To Alexander Small.

Dear Friend:

I have just received your kind letter of November 29th, and am much obliged by your friendly attention in sending me the receipt, which on occasion I may make trial of; but the stone I have being a large one,

as I find by the weight it falls with when I turn in bed, I have no hope of its being dissoluble by any medicine; and having been for some time past pretty free from pain, I am afraid of tampering. I congratulate you on the escape you had by avoiding the one you mention, that was as big as a kidney bean; had it been retained, it might soon have become too large to pass, and proved the cause of much pain at times, as mine has been to me. . . .

. . . The deafness you complain of gives me concern, as if great it must diminish considerably your pleasure in conversation. If moderate, you may remedy it easily and readily, by putting your thumb and fingers behind your ear, pressing it outwards, and enlarging it, as it were, with the hollow of your hand. By an exact experiment I found, that I could hear the tick of a watch at forty-five feet distance by this means, which was barely audible at twenty feet without it. The experiment was made at midnight when the house was still. . . .

Franklin took opium for his pain, but recognized well the penalty he must thereby pay.

Philadelphia, Sept. 5, 1789.

To. M. Le. Veillard.

. . . I hope you have perfectly recovered of the Effects of your Fall at Madam Helvetius', and that you now enjoy perfect Health; as to mine, I can give you no good account. I have a long time been afflicted with almost constant and grievous Pain, to combat which I have been obliged to have recourse to Opium, which indeed has afforded me some Ease from time to time, but then it has taken away my Appetite and so impeded my Digestion that I am become totally emaciated, and little remains of me but a Skeleton covered with a Skin. . . .

Philadelphia, November 2, 1789.

To Benjamin Vaughan.

My Dearest Friend:

I received your kind letter of August 8th. I thank you much for your intimations of the virtues of hemlock, but I have tried so many things with so little effect, that I am quite discouraged, and have no longer any faith in remedies for the stone. The palliating system is what I am now fixed in. Opium gives me ease when I am attacked by pain, and by the use of it I still make life at least tolerable. Not being able

however, to bear sitting to write, I now make use of the hand of one of my grandsons, dictating to him from my bed. . . .

Still another reference to Franklin's treating cases of nervous disease by electricity is found in a letter to Ezra Stiles, who had written to Franklin saying that he had not an idea of his religious sentiments, and wished to know his opinion concerning Jesus of Nazareth, Franklin in replying said:

Philadelphia, March 9, 1790.

To Ezra Stiles.

. . . I shall only add, respecting myself, that, having experienced the Goodness of that Being in conducting me prosperously thro' a long life, I have no doubt of its Continuance in the next, though without the smallest Conceit of meriting such Goodness. My Sentiments on this Head you will see in the copy of an old Letter enclosed, which I wrote in answer to one from a zealous Religionist, whom I had relieved in a paralytic case by electricity, and who, being afraid I should grow proud upon it, sent me his serious though rather impertinent Caution. . . .

Two of Franklin's so-called bagatelles have been already copied in part, the following also has some bearing upon medical matters as well. This was written when he was eighty years of age.

The Art of Procuring Pleasant Dreams.

Inscribed to Miss Shipley, being written at her request.

As a great part of our life is spent in sleep during which we have sometimes painful dreams, it becomes of some consequence to obtain the one kind and avoid the other; for whether real or imaginary, pain is pain and pleasure is pleasure. If we can sleep without dreaming, it is well that painful dreams are avoided. If while we sleep we can have any pleasing dream, it is, as the French say, *autant de gagné*, so much added to the pleasure of life.

To this end it is, in the first place, necessary to be careful in preserving health, by due exercise and great temperance; for, in sickness, the imagination is disturbed, and disagreeable, sometimes terrible, ideas are apt to present themselves. Exercise should precede meals, not

immediately follow them; the first promotes, the latter, unless moderate, obstructs digestion. If, after exercise, we feed sparingly, the digestion will be good and easy, the body lightsome, the temper cheerful, and all the animal functions performed agreeably. Sleep, when it follows, will be natural and undisturbed, while indolence, with full feeding, occasions nightmares and horrors inexpressible; we fall from precipices, are assaulted by wild beasts, murderers, and demons, and experience every variety of distress. Observe, however, that the quantities of food and exercise are relative things; those who move much may, and indeed ought to eat more; those who use little exercise should eat little. In general, mankind, since the improvement of cookery, eat twice as much as nature requires. Suppers are not bad, if we have not dined; but restless nights naturally follow hearty suppers after full dinners. Indeed, as there is a difference in constitutions, some rest well after these meals; it costs them only a frightful dream and an apoplexy, after which they sleep till doomsday. Nothing is more common in the newspapers, than instances of people who, after eating a hearty supper, are found dead abed in the morning.

Another means of preserving health, to be attended to, is the having a constant supply of fresh air in your bed-chamber. It has been a great mistake, the sleeping in rooms exactly closed, and in beds surrounded by curtains. No outward air that may come in to you is so unwholesome as the unchanged air, often breathed, of a close chamber. As boiling water does not grow hotter by boiling longer, if the particles that receive greater heat can escape; so living bodies do not putrefy, if the particles, so fast as they become putrefied, can be thrown off. Nature expels them by the pores of the skin and the lungs, and in a free, open air they are carried off; but in a close room we receive them again and again, though they become more and more corrupt. A number of persons crowded into a small room thus spoil the air in a few minutes, and even render it mortal, as in the Black Hole at Calcutta. A single person is said to spoil only a gallon of air per minute, and therefore requires a longer time to spoil a chamber-full; but it is done, however, in a proportion, and many putrid disorders hence have their origin. It is recorded of Methusalem, who, being the longest liver, may be supposed to have best preserved his health, that he slept always in the open air; for, when he had lived five hundred years, an angel said to him; "Arise,

Methusalem, and build thee a house, for thou shalt live yet five hundred years longer." But Methusalem answered, and said, "If I am to live but five hundred years longer, it is not worth while to build me an house; I will sleep in the air, as I have been used to do." Physicians, after having for ages contended that the sick should not be indulged with fresh air, have at length discovered that it may do them good. It is therefore to be hoped that they may in time discover likewise, that it is not hurtful to those who are in health, and that we may be then cured of the *aërophobia*, that at present distresses weak minds, and makes them choose to be stifled and poisoned, rather than leave open the window of a bedchamber, or put down the glass of a coach.

Confined air, when saturated and perspirable matter, will not receive more; and that matter must remain in our bodies, and occasion diseases, but it gives some previous notice of its being about to be hurtful, by producing certain uneasiness, slight indeed at first, which as with regard to the lungs is a trifling sensation, and to the pores of the skin a kind of restlessness, which is difficult to describe, and few that feel it know the cause of it. But we may recollect, that sometimes on waking in the night, we have, if warmly covered, found it difficult to get asleep again. We turn often without finding repose in any position. This figettiness (to use a vulgar expression for want of a better) is occasioned wholly by an uneasiness in the skin, owing to the retention of the perspirable matter—the bed-clothes having received their quantity, and, being saturated, refusing to take any more. To become sensible of this by an experiment, let a person keep his position in the bed, but throw off the bed-clothes, and suffer fresh air to approach the part uncovered of his body; he will then feel that part suddenly refreshed; for the air will immediately relieve the skin, by receiving, licking up, and carrying off, the load of perspirable matter that incommoded it. For every portion of cool air that approaches the warm skin, in receiving its part of that vapour, receives therewith a degree of heat that rarefies and renders it lighter, when it will be pushed away with its burthen, by cooler and therefore heavier fresh air, which for a moment supplies its place, and then likewise changed and warmed, gives way to a succeeding quantity. This is the order of nature, to prevent animals being infected by their own perspiration. He will now be sensible of the difference between the part exposed to the air and that which, remaining sunk in the bed,

denies the air access; for this part now manifests its uneasiness more distinctly by the comparison, and the seat of the uneasiness is more plainly perceived than when the whole surface of the body was affected by it.

Here, then, is one great and general cause of unpleasing dreams. For when the body is uneasy, the mind will be disturbed by it, and disagreeable ideas of various kinds will in sleep be the natural consequence. The remedies, preventive and curative, follow:

1. By eating moderately (as before advised for health's sake) less perspirable matter is produced in a given time; hence the bed-clothes receive it longer before they are saturated, and we may therefore sleep longer before we are made uneasy by their refusing to receive any more.

2. By using thinner and more porous bed-clothes, which will suffer the perspirable matter more easily to pass through them, we are less incommoded, such being longer tolerable.

3. When you are awakened by this uneasiness, and find you cannot easily sleep again, get out of bed, beat up and turn your pillow, shake the bed-clothes well, with at least twenty shakes, then throw the bed open and leave it to cool; in the meanwhile, continuing undrest, walk about your chamber till your skin has had time to discharge its load, which it will do sooner as the air may be dried and colder. When you begin to feel the cold air unpleasant, then return to your bed, and you will soon fall asleep, and your sleep will be sweet and pleasant. All the scenes presented to your fancy will be too of the pleasing kind. I am often as agreeably entertained with them, as by the scenery of an opera. If you happen to be too indolent to get out of bed, you may, instead of it, lift up your bed-clothes with one arm and leg, so as to draw in a good deal of fresh air, and by letting them fall force it out again. This, repeated twenty times, will so clear them of the perspirable matter they have imbibed, as to permit your sleeping well for some time afterwards. But this latter method is not equal to the former.

Those who do not love trouble, and can afford to have two beds, will find great luxury in rising, when they wake in a hot bed, and going into the cool one. Such shifting of beds would also be of great service to persons ill of a fever, as it refreshes and frequently procures sleep. A very large bed, that will admit a removal so distant from the first

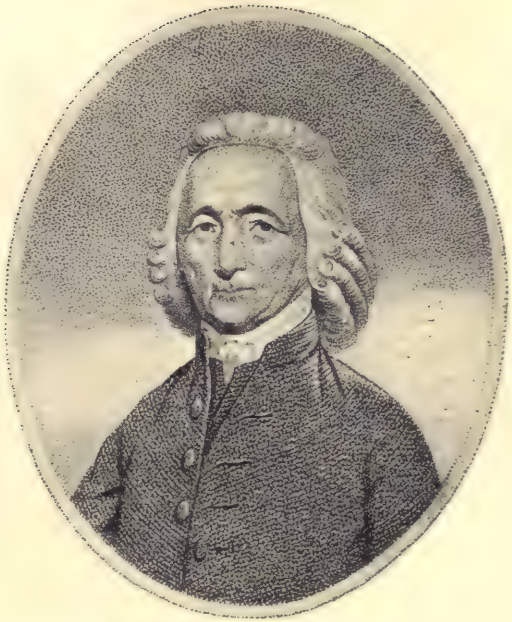


Fig. 35.—Dr. John Redman.

John Redman, 1722–1806. Eminent practitioner of medicine in Philadelphia, Studied at Edinburg, London, and Paris. Graduated at the University of Leyden in 1748. Was elected the first president of the College of Physicians in 1786. A friend of Franklin's.

situation as to be cool and sweet, may in a degree answer the same end.

One or two observations more will conclude this little piece. Care must be taken, when you lie down, to dispose your pillow so as to suit your manner of placing your head, and to be perfectly easy; then place your limbs so as not to bear inconveniently hard upon one another, as, for instance, the joints of your ankles; for, though a bad position may at first give but little pain and be hardly noticed, yet a continuance will render it less tolerable, and the uneasiness may come on while you are asleep, and disturb your imagination. These are the rules of the art. But, though they will generally prove effectual in producing the end intended, there is a case in which the most punctual observance of them will be totally fruitless. I need not mention the case to you, my dear friend, but my account of the art would be imperfect without it. The case is, when the person who desires to have pleasant dreams has not taken care to preserve, what is necessary above all things,

A Good Conscience.

In the last years of Benjamin Franklin's life when suffering from a complication of maladies, Cutler relates that "he used a warm bath every day" in a "bathing vessel said to be a curiosity. It is copper, in the form of a Slipper. He sits in the Heel, and his legs go under the Vamp; on the Instep he has a place to fix his book, and here he sits and enjoys himself. About the time I left the city of Philadelphia, they chose him President of the Executive Council. His accepting the office is a sure sign of senility. But would it not be a capital subject for an historical painting . . . the Doctor placed at the head of the Council Board in his bathing slipper?"

Some reference to Benjamin Franklin's last illness and death, may well be quoted here.

In 1735 he had pleurisy which terminated in an abscess of the left lobe of the lungs, and he was almost suffocated with the quantity and suddenness of the discharge which occurred when the abscess ruptured.

This may have had some influence upon his final illness of which it is said by Dr. John Jones,[1] his physician:

"The stone with which he had been afflicted for several years, had for the last twelve months confined him chiefly to his bed; and during the extremely painful paroxysms, he was obliged to take large doses of laudanum to mitigate his tortures . . . still, in the intervals of pain, he not only amused himself with reading and conversing cheerfully with his family, and a few friends who visited him, but was often employed in doing business of a public as well as private nature, with various persons who waited on him for that purpose: and in every instance displayed, not only that readiness and disposition of doing good, which was the distinguishing characteristic of his life, but the fullest and clearest possession of his uncommon mental abilities; and not unfrequently indulged himself in those 'jeux d'esprit' and entertaining anecdotes, which were the delight of all who heard him.

"About sixteen days before his death he was seized with a feverish indisposition, without any particular symptoms attending it, till the third or fourth day, when he complained of a pain in the left breast, which increased till it became extremely acute, attended with a cough and laborious breathing. During this state when the severity of his pain drew forth a groan of complaint, he would observe . . . that he was afraid he did not bear them as he ought . . . acknowledged his grateful sense of the many blessings he had received from that Supreme Being, who had raised him from small and low beginnings to such high rank and consideration among men . . . and made no doubt but his present afflictions were kindly intended to wean him from a world, in which he was no longer fit to act the part assigned him. In this frame of body and mind he continued till five days before his death, when his pain and difficulty of breathing entirely left him, and his family were flattering themselves with the hopes of his recovery, when an imposthumation, which had formed itself in his lungs, suddenly burst, and dis-

[1] John Jones, 1729-1791. Born on Long Island, studied under Dr. Thomas Cadwalader, of Philadelphia. Received the degree of M.D. from the University of Rheims. Practiced in New York. Surgeon during the Revolution. Member of American Philosophical Society. Professor of Surgery in the College of New York. In 1775 published "Plain Remarks upon Wounds and Fractures." Removed to Philadelphia in 1780. Elected physician to Pennsylvania Hospital and to the Philadelphia Hospital. Attended George Washington.

FIG. 36.—Dr. John Jones.

charged a great quantity of matter, which he continued to throw up while he had sufficient strength to do it; but, as that failed, the organs of respiration became gradually oppressed, a calm lethargic state succeeded, and on the 17th of April, 1790, about eleven o'clock at night, he quietly expired, closing a long and useful life of eighty-four years and three months."

Dr. Rush wrote to Dr. Price.

The papers will inform you of the death of our late friend, Dr. Franklin. The evening of his life was marked by the activity of his moral and intellectual powers which distinguished its meridian. His conversation with his family upon the subject of his dissolution was free and cheerful. A few days before he died he rose from his bed and begged that it might be made up for him so that he might die in a decent manner. His daughter told him that she hoped he would recover and live many years longer. He calmly replied, "I hope not." Upon being advised to change his position in bed, that he might breathe easy, he said, "A dying man can do nothing easy." All orders and bodies of people have vied with each other in paying tributes of respect to his memory.

In Franklin's will appears the following: "I give twenty guineas to my good friend and physician, Dr. John Jones."

Dr. Benjamin Franklin in his will bequeathed to the Pennsylvania Hospital a great number of old unpaid debts owing to him, anmouting to over £5,000 expressing the hope, "that those debtors and the descendants of such as are deceased who now as I find make some difficulties of satisfying such antiquated demands as just debts, may however be induced to pay or give them as Charity to that excellent Institution." But at a meeting held to consider the advisability of accepting this peculiar gift, it was the unanimous opinion of all the contributors present, that this legacy could not with safety be accepted. The difficulty lay in the fact that most of these debts were so old that there was not the slightest hope of their being paid; while Franklin had stated that any accounts on the other side of the Ledger, in the form of charges against him, should be paid by the Managers.

Many physicians who were friends of Franklin's have not been mentioned in the preceeding pages because in the correspondence which remains to us, there is nothing of medical interest. Notably among these should be mentioned: Dr. Thomas Cadwalader, the author of

An Essay on the West-India Dry Gripes; with the Method of Preventing and Curing that Cruel Distemper. To which is added, An Extraordinary Case in Physick, Philadelphia: Printed and sold by B. Franklin. MDCCXLV.

Dr. Cadwalader begged Franklin to accept the dedication of his work.

Dr. Alexander Garden,[1] a frequent correspondent of Franklin's.

Dr. Phineas Bond,[2] who with his brother, Dr. Thomas Bond, were members of a society, started by Franklin, for promoting useful knowledge, which later became the American Philosophical Society. The two Dr. Bonds were great friends of Franklin's.

Dr. Rene Georges Gastelier,[3] who wrote an essay upon the persistence of sensation after decapitation by the guillotine, wished to dedicate his work on "Species in Medicine," to Franklin and persuaded the Marquis of Mirabeau to intercede for him.

Dr. William Brownrigg,[4] whose name is linked with Franklin's in a book entitled "Of the Stilling of Waves by means of Oil: Extracted from Sundry Letters between Benjamin Franklin, LL.D., F.R.S., William Brownrigg, M.D., F.R.S., and the Reverend Mr. Farish. Read at the Royal Society, June 12, 1774, London 1774."

Sir Charles Blagden,[5] who aided Franklin in one of his experiments upon the effects of oil on stilling waves.

Dr. Edward Bancroft,[6] who although an Englishman, apparently favored the American cause and who has even been accused of having been a spy.

[1] Alexander Garden, 1730-1791. A British physician, zoölogist, botanist, who lived for many years in Charlestown, South Carolina, where he practiced medicine. Linnaeus named the genus *Gardenia* after him.

[2] Phineas Bond, 1717–1773. Born in Maryland, studied medicine in Leyden, Paris, Edinburgh, and London. Original trustee of the University of Pennsylvania. Member of the first medical staff of the Pennsylvania Hospital.

[3] Rene Georges Gastelier, 1741–1821. French physician and medical writer.

[4] William Brownrigg, 1711-1800. English physician and natural philosopher. Fellow of the Royal Society.

[5] Sir Charles Blagden, 1748–1820. An English physician. Entered the army. Fellow of the Royal Society. Of him Dr. Johnson said, "Blagden, sir, is a delightful fellow."

[6] Edward Bancroft, 1744-1821. English physician, chemist, naturalist, and author. Fellow of the Royal Society.

INDEX

Adams, John, 77
Animal magnetism, 85, 87
Archer, Dr., 38
Astruc, Dr. Jean, 53
Bailly, Jean Sylvain, 85, 87
Bancroft, Dr. Edward, 118
Bard, Dr. John, 23
Bard, Dr. Samuel, 44
Bifocal lenses, 97
Black, Dr. Joseph, 57
Blayden, Sir Charles, 118
Bond, Dr. Phineas, 118
Bond, Dr. Richard, 53, 55, 56
Bond, Dr. Thomas, 12, 15, 16, 30, 53, 54
Boylstone, Dr. Zabdiel, 36
Brillon, Mme., 81
Buffon, Comte de, 107
Cadwalader, Dr. Thomas, 117
Cancer, 20, 27, 58
Carey, Mathew, 9
Catheter, invention of, 28
Clark, Dr. George, 43
Clephane, Dr. John, 30
Colds, 41, 50, 60, 63, 72, 73
Cold baths, 29, 49
Cold air baths, 49
Colden Cadwallader, 21, 23, 24
Collinson, Peter, 30
Constipation, 68
Consumption, 70
Cooling applications to reduce fever or inflammation, 33
Croghan, George, 47
Cullen, Dr. William, 41, 56, 57, 72
Cushing, Dr. Henry K., 34
Cutler, Manasseh, 84, 115
D'Arcet, Dr. Jean, 85, 87
Darwin, Dr. Erasmus, 105
de Bory, 85, 87
De La Condamine, La Sabliere, 88
de Tawdrez, Dr. Daniel Nunez, 76
Deslon (Desler), 86, 89
Diarrhœa, 59
Dick, Sir Alexander, 44, 57
Diderot, Denis, 102
Dollond, Peter, 97
Dropsy, 76
Drugs, 21, 26, 27, 28, 29, 30, 53, 80, 88, 91, 93, 95, 108, 110, 116
Dry belly-ache, 49, 103
Dubourg, Dr. Barben, 49, 60, 63, 72, 78, 102
Edinburgh Medical School, 53, 55, 56
Electricity, used medically, 29, 31, 88, 92, 111
Eliot, Jared, 26
Elmer, Dr. Jonathan, 54, 55
Epilepsy, 92
Evans, Dr. Cadwallader, 46, 48
Ferin, 53
Ferguson, Adam, 57
Fever, 50, 63, 70, 71, 83
Fever-and-ague, 26
Fisher, Sydney George, 9
Fixed air (carbonic acid gas), 57
Flux, 24
Ford, Paul Leicester, 9
Fothergill, Dr. John, 78, 79, 98
Foundlings, 96
Franklin, Abiah Folger (Mrs. Josiah, mother of B. F.), 24
Franklin, Benjamin, account of his last illness and death, 115
- Advice asked upon a proposed surgical operation, 29
- Advises using fixed air (carbonic acid gas) in cancer, 58
- Appointed by King of France to investigate Mesmer, 85, 87
- As an ophthalmologist, 95
- As an alienist, 76
- Asked to recommend a preventive for the smallpox, 28
- Asked to treat the Duke of Ancaster's daughter with electricity, 33
- Autobiography, 12, 15, 19
- Causes of colds, 65, 67, 73, 74, 77, 99
- Consulted about hernia, 78
- Consulted on ventilation of hospitals, 78
- Cures the Earl of Buchan, 89
- Daughter inoculated, 15

Franklin, Benjamin, describes attack of gout, 52, 80, 90, 109
Discusses elephant's teeth, 47
Discusses how long infection may remain in dead bodies, 82, 93
Discusses lead poisoning, 48, 103
Discusses nyctalopia,
Draws up report of commission to investigate Mesmer, 85, 87, 88, 89
Election to Royal Society, 18, 19, 60
Experiments in treatment of gout, 80
Experiments on amount of perspiration, 61, 62, 63
Has malaria, 75
His advice requested in treatment of a paralytic, 90
His "art of procuring pleasnat dreams," 111
His "dialogue between Franklin and the gout," 81
His machine for exhibiting the circulation of the blood, 84
His medical friends in Edinburgh, 43, 56
His opinion sought on Russian vapor baths,
His theory that colds are not caused by dampness or draughts or cold alone, 64, 65, 66, 67, 68, 69, 71, 73, 74, 77, 99
His treatment of fever and pain in the side, 30
Improved the pulse-glass, 84
Invents a flexible catheter, 28
Invention of bifocal lenses, 95, 97
Many of his friends medical men, 12
Member of Royal Medical Society of Paris, 81
Not a medical graduate, 10
On animal magnetism, 88
On absorption and perspiration, 22, 63, 64, 70, 77, 80, 100
On "catching cold," 41, 50, 60, 63, 73, 74, 77, 100
On dangers of cold water when overheated, 59
On distilling spirit from milk, 83
On exercise with dumb bells, 111
On exercise, 52, 80, 90, 109
On fever and ague, 15
On flesh of animals killed by electricity, 62
On fresh air, 63, 74, 100, 112
On holding surgeons as prisoners, 78
On imbibing and discharging pores of skin, 40, 63, 69, 71, 113
On infant mortality, 97
On inoculation, 15
On long-continued fever, 50
On medical education, 55, 56
Franklin, Benjamin, on overeating and drinking, 64, 68, 74
On preventing colds, 65, 66
On prevention of disease, 59
On race suicide, 95
On rate of pulse, 59
On resuscitation of drowned flies, 61
On sea-sickness, 48
On swimming as means of stopping diarrhœa, 59
On swimming as an exercise, 59
On the cause of the heat of the blood, 24
On the cold and hot fits of some fever, 24
On the circulation of the blood, 22, 23, 64, 69
Pennsylvania Hospital, 12, 16, 17, 18, 19, 46, 48, 60, 117
Persuades Dr. Heberden to write an account of the success of inoculation and writes introduction to same, 34
Proposed paper on catching cold, 60, 63, 64
Proposes Dr. Dubourg and Sir John Pringle for membership in American Philosophical Society, 60
Receives honorary degree of Doctor in Laws from University of St. Andrew's, 10
Recommends bathing in cold water, 49
Requested to cure a case of gout, 90
Sells Sir Hans Sloan a purse, 14
Son Francis dies of smallpox, 15
States that, "the cold fever is communicable by the breath to others," 71
Suggests cooling applications to reduce fever and inflammation, 33
Suggests experiment for testing effect of lime water on bladder, 29
Suggests sitting in water to relieve thirst, 40, 50
Suggests that some sort of effluvia in the air cause colds, 65, 66, 67, 71, 72, 100
Supposed to have discovered a cure for dropsy, 76
Treats patients with electricity, 29, 31, 92, 111
Tries a vegetable diet, 13
Writes letters of introduction for John Morgan, 41, 42
Election to Royal Society, 18, 19, 60
Franklin, Deborah Read (wife of B. F.), 30, 45, 52, 76, 102
Franklin, John (brother of B. F.), 28
Franklin, William (son of B. F.), 57, 58

Franklin, William Temple (grandson of B. F.), 88
Fresh air, 63, 74, 99, 106
Galloway, Joseph, 60
Garden, Dr. Alexander, 118
Gastelier, Dr. Rene Georges, 118
Gaubius, Dr. Hieronymus David, 53
Gout, 46, 52, 80, 81, 90, 95, 109
Gregory, Dr. John, 56
Griffitts, Dr. Samuel Powell, 12
Guillotin, Dr. Joseph Ignace, 85, 87
Harvey, Dr. William, 80
Hawkesworth, John, 57
Hays, Dr. I. Minis, 9
Heberden, Dr. William, 34
Hernia, 78
Hewson, Dr. Thomas Tickell, 75
Hewson, Dr. William, 75, 76
Home, Dr. Francis, 57
Hope, Dr. John, 57
Huck, Dr. Richard (Saunders), 62
Huey, Joseph, 29
Hume, David, 57
Hunauld's (Huno), Dr. Francis Joseph, 53
Hunter, Dr. John, 49, 75, 78
Hunter, Dr. William, 75
Infant feeding, 97
Infant mortality, 97
Influenza, 74
Ingenhousz, Dr. Jan, 92, 94, 99, 109
Inoculation, 15, 26, 27, 34
Insanity, 76, 92
Jay, John, 90
Jefferson, Thomas, 9
Jenner, Dr. Edward, 9
Jessieu, 102
Johnston, James, 60
Johnson, Rev. Samuel, 26, 27
Jones, Dr. John, 77, 91, 116, 117
Kames, Lord (Henry Home), 42, 57
Kuhn, Dr. Adam, 12, 53
Kuhn, Daniel, 53, 54, 55
Lactation, 96
Lavoisier, Antoine Laurent, 63, 85, 87
Lead poisoning, 48, 103
Lee, Arthur, 76
Le Roy, Jean Baptiste, 63, 85, 87, 102, 107
Lettsom, Dr. J. Coakley, 98, 99
LeVeillard, 107
Leyden, medical education in, 53
Linnaeus, Carl, 84
Lind, Dr. James, 50
Lining, Dr. John, 29, 33
Le Cat, Dr. Claude Nicolas, 53
London, medical education in, 53, 55
Macclesfield, Lord, 19
Macquair, Dr. Pierre Joseph, 102
Majault, 85, 87
Mammary glands, 96
Martin, David, 26, 27
Mead, Dr. Richard, 29
Measles, 24
Mecom, Mrs. Jane (sister of B. F.), 20
Mesmer, Frederich Anton, 85, 88, 93
Mirabeau, Marquis de, 102
Mitchell, Dr. John, 23
Monro, Dr. Alexander (Primus), 43
Monro, Dr. Alexander (Secundus), 43, 56
Morgan, Dr. John, 12, 41, 42, 44, 45
McBride, Dr. David, 57, 58
M'Gawn or McGowen, 43, 57
Nollet, Jean Antoine, 102
Nyctalopia, 108
Paralysis, 31, 92
Paris Academy of Surgery, 53
Pennsylvania Hospital, 12, 15, 16, 17, 18, 46, 48, 54, 99
Percival, Thomas, 73
Poissoniere, Dr. Pierre, 72
Pores of skin, 40, 69, 70, 71
Priestley, Dr. Joseph, 58, 72, 75, 103
Pringle, Sir John, 31, 45, 48, 54, 56, 60, 62, 101, 109
Quinsey, 27
Rae, Dr. John, 57
Raume, 102
Rheumatism, 52
Robertson, William, 57
Rosengarten, Joseph G., 45
Roux, Dr. Augustus, 102
Royal Society, 19
Rush, Dr. Benjamin, 12, 72, 101, 102
Russell, Dr. Alexander, 43, 57
Sallin, 85, 87
Saunders, Dr. Richard Huck, 62
Schweighauser, John D., 78
Sea-sickness, 48
Shippen, Dr. William, Jr., 12, 41, 47
Skin-disease, 109
Sloan, Sir Hans, 14
Small, Dr. Alexander, 78, 80, 109
Small-pox, 15, 20, 26, 27, 28, 34, 49, 63, 71
Smith, Rev. William, 26, 84
Smyth, Albert Henry, 9
Spectacles, 97
Stark, Dr. William, 61, 62
Stevenson, Miss Mary, 40, 50, 75, 90
Stevenson, Mrs. Margaret, 40
Stiles, Ezra, 111
Stone in the bladder, 21, 90, 91, 93, 95, 107, 108, 109, 110, 116
Sue, Dr. Pierre, 102
Tissington, Anthony, 52
Tracheotomy, 27
University of Pennsylvania (College and Academy of Philadelphia), 45, 53, 54, 56
Vanswieten, Dr. Gerard, 53

Vaughan, Benjamin, 91, 103, 110
Vergennes, Comte de, 90
Vicq d'Azyr, Dr. Felix, 81, 82
Vienna, medical education in, 53
Vital statistics, 73
Voltaire, 102
Warm baths, 59, 115
Waterhouse, Dr. Benjamin, 78
Watson, Sir William, 19, 45
Webster, Noah, 9
Wet nurses, 97
Whatley, George, 95
Whitefoord, Caleb, 95
Whytt, Robert, 29
Winslow, Dr. Jakob Benignus, 53
Worm in liver, 30
Wright, Dr., 19
Wrist-drop, 104
Yellow fever, 23, 24
Young, Dr. Thomas, 57

E
302
.6
F8P4

Pepper, William
The medical side of
Benjamin Franklin

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY